# 3.6 Public Utilities and Energy

## 3.6.1 Introduction

This section describes the public utilities and energy resources in the San Francisco to San Jose Project Section (Project Section, or project) resource study area (RSA). This analysis evaluates potential project impacts on utility services, access to existing utilities for routine maintenance, water use, waste generation, storm drain facilities, and energy consumption.

The following appendices in Volume 2 of this Draft Environmental Impact Report (EIR)/Environmental Impact Statement (EIS) provide additional details on public utilities and energy:

- Appendix 2-C, Operations and Service Plan Summary, provides background information on the intended service and operations of the high-speed rail (HSR) system.
- Appendix 2-D, Applicable Design Standards, describes the relevant design standards for the project.
- Appendix 2-E, Project Impact Avoidance and Minimization Features, provides the list of all impact avoidance and minimization features (IAMF) incorporated into this project.
- Appendix 2-I, Regional and Local Plans and Policies, provides a list by resource of all applicable regional and local plans and policies.
- Appendix 3.6-A, Public Utilities and Energy Facilities, identifies existing utilities and energy facilities in the public utilities RSA and provides a determination of whether relocation or protection in place would be required.
- Appendix 3.6-B, Existing Plus Project Conditions Energy Analysis, compares existing physical conditions for the energy analysis to the existing plus project conditions to estimate statewide energy use with and without the HSR project.
- Appendix 3.6-C, Water Use Assessment, provides an analysis and evaluation of anticipated water use requirements for construction and operations of the project.
- Appendix 3.6-D, Energy Analysis Memorandum, describes the calculation of statewide energy consumption as well as criteria pollutant and greenhouse gas (GHG) emission levels associated with future operation of the HSR system, which were used in this analysis.

*Public Utilities*

Public utilities impacts include major utility lines (electricity, natural gas, petroleum, water, communications) in the right-of-way of the project alternatives that would need to be relocated or protected in place during construction. Alternative A would require relocation or protection in place of 259 major utilities; Alternative B (Viaduct to I-880) would require 239 relocations or protections in place; and Alternative B (Viaduct to Scott Boulevard) would require 233 relocations or protections in place.

*Energy*

Energy resource impacts include energy consumption for construction and operations; Alternative A would consume 9,977 billion Btu of energy for construction, Alternative B (Viaduct to I-880) would consume 10,911 billion Btu of energy, and Alternative B (Viaduct to Scott Boulevard) would consume 10,778 billion Btu of energy for construction. Operations would result in a net decrease in energy consumption of 6,188,240 MMBtu per year for the medium ridership scenario and a net decrease of 6,088,470 MMBtu per year for the high ridership scenario in 2040.

Public utilities and energy resources are important factors for construction and operation of the project. Construction of the project would require the relocation of public utilities, potentially resulting in impacts on the utilities and utility services. Construction and operation of the project would also consume energy including electricity, natural gas, and petroleum products, potentially affecting energy supply. This section also considers energy demand when viewed on a systemwide basis, because HSR operations would affect energy consumption for other modes of transportation. The following five EIR/EIS resource sections provide additional information related to public utilities and energy:

- Section 3.2, Transportation, evaluates impacts on traffic, including road closures and roadway access as a result of utility relocations during project construction.

- Section 3.3, Air Quality and Greenhouse Gases, evaluates impacts on air quality and GHG emissions from construction and operation of the project.
- Section 3.5, Electromagnetic Fields and Electromagnetic Interference, evaluates impacts of the project on sensitive land uses that are susceptible to potential impacts from electromagnetic fields and electromagnetic interference.
- Section 3.8, Hydrology and Water Resources, evaluates impacts of the project on drainage and stormwater management infrastructure and utility systems along the alignment during construction.
- Section 3.11, Safety and Security, evaluates impacts of high-risk facilities including natural gas and crude oil liquid pipelines, electric transmission lines, and water lines. The analysis in Section 3.11 includes impacts of the project on high-risk utilities while the analysis in this section focuses on the impacts on major utilities, some of which are also considered high-risk utilities. Similarly, some of the high-risk utilities analyzed in Section 3.11 are also considered major utilities.

#### *3.6.1.1 Key Definitions*

The following are definitions for public utilities and energy resources analyzed in this Draft EIR/EIS.

- **Public utilities**—Public utilities are defined as any subsurface, aboveground, or overhead facility used for transmission, regardless of size, shape, or method of conveyance. This impact evaluation focuses on major public utilities, which include the following types of facilities:
  - Electrical substations
  - High-voltage electrical lines (50 kilovolts [kV] or greater)
  - High-pressure natural gas pipelines of outside diameter ≥ 20 inches
  - Petroleum (crude oil) and petroleum product fuel pipelines of outside diameter ≥ 20 inches
  - Water lines (including potable and irrigation water lines) of outside diameter ≥ 20 inches
  - Wastewater lines of outside diameter ≥ 20 inches
  - Stormwater canals, conduits, and pipes of outside diameter ≥ 42 inches
  - Fiber optic lines and telecommunication cables
- **Energy**—Energy is commonly measured in terms of British thermal units (Btu). A Btu is defined as the amount of heat required to raise the temperature of 1 pound of water by 1 degree Fahrenheit. For transportation projects, energy usage is predominantly influenced by the amount of fuel used for construction and operation. The average Btu content of fuels is the heat value (or energy content) per quantity of fuel as determined from tests of fuel samples. For example, a gallon of gasoline produces approximately 120,000 Btu (U.S. Energy Information Administration [EIA] 2018a); however, the Btu value of gasoline varies from season to season and from batch to batch. The Btu is the unit of measure used to quantify the overall energy impacts expected to result from construction and operations of the HSR system.
- **Transportation energy**—Transportation energy is generally defined in terms of direct and indirect energy.
  - Direct energy involves all energy consumed by vehicle propulsion (e.g., automobiles, trains, airplanes). This energy is a function of traffic characteristics such as volume, speed, distance traveled, vehicle mix, and thermal value of the fuel being used. Direct energy also includes the electrical power requirements of the HSR system, including recoverable energy during HSR train braking.

- Indirect energy consumption is the nonrecoverable, one-time energy expenditure involved in constructing the physical infrastructure and systems associated with the project, typically through the irreversible burning of hydrocarbons for operating equipment and vehicles in which energy is lost to the environment and consumption of electricity for lighting, operation of equipment such as ticket machines, and other purposes at stations.

## 3.6.2 Laws, Regulations, and Orders

This section presents federal and state laws, regulations, and orders applicable to public utilities and energy. The California High-Speed Rail Authority (Authority) would implement the HSR system, including this project, in compliance with all federal and state regulations. Volume 2, Appendix 2-I provides regional and local plans and policies relevant to public utilities and energy considered in the preparation of this analysis.

### *3.6.2.1 Federal*

**Federal Railroad Administration Procedures for Considering Environmental Impacts (64 *Federal Register* 28545)**

The Federal Railroad Administration (FRA) Procedures for Considering Environmental Impacts state that an EIS should consider possible impacts on energy production and consumption, especially those alternatives likely to reduce the use of petroleum or natural gas consistent with the policy outlined in U.S. Presidential Executive Order (USEO) 12185.

**Section 403(b) of the Power Plant and Industrial Fuel Use Act (USEO 12185; 44 *Federal Register* 75093; Public Law 95-620)**

Section 403(b) of the Power Plant and Industrial Fuel Use Act and USEO 12185 encourage additional conservation of petroleum and natural gas by recipients of federal financial assistance.

**Norman Y. Mineta Research and Special Programs Improvement Act (Public Law 108-426)**

The Norman Y. Mineta Research and Special Programs Improvement Act established the U.S. Department of Transportation's (USDOT) Pipeline and Hazardous Materials Safety Administration, which regulates safe movement of hazardous materials to industry and consumers by all modes of transportation, including pipelines. This act requires pipeline owners and operators to meet specific standards and qualifications, including participating in public safety programs that notify an operator of proposed demolition, excavation, tunneling, or construction near or affecting a pipeline. This includes identifying pipelines that may be affected by such activities and identifying any hazards that may affect a pipeline. In California, the Office of the Fire Marshal administers pipeline safety.

**Federal Energy Regulatory Commission**

The Federal Energy Regulatory Commission (FERC) is an independent agency that regulates the interstate transmission of natural gas, oil, and electricity. FERC also regulates natural gas and hydropower projects. As part of that responsibility, FERC regulates the transmission and sale of natural gas for resale in interstate commerce, the transmission of oil by pipeline in interstate commerce, and the transmission and wholesale of electricity in interstate commerce. FERC also licenses and inspects private, municipal, and state hydroelectric projects; approves the siting and abandonment of interstate natural gas facilities, including pipelines, storage, and liquefied natural gas; oversees environmental matters related to natural gas and hydroelectricity projects and major electricity policy initiatives; and administers accounting and financial reporting regulations and conduct of regulated companies.

**Corporate Average Fuel Economy**

Corporate Average Fuel Economy (CAFE) standards are federal regulations that are set to reduce energy consumed by on-road motor vehicles. The USDOT's National Highway Traffic Safety Administration (NHTSA) regulates the standards, and the U.S. Environmental Protection Agency (USEPA) measures vehicle fuel efficiency. The standards specify minimum fuel consumption efficiency standards for all light-duty vehicles sold in the United States. The updated standards apply to new passenger cars, light-duty trucks, and medium-duty passenger vehicles, covering model years 2017 through 2025, and are equivalent to 54.5 miles per gallon.

On August 2, 2018, the NHTSA and USEPA proposed to amend the fuel efficiency standards for passenger cars and light trucks and establish new standards covering model years 2021 through 2026 by maintaining the current model year 2020 standards through 2026 (Safer Affordable Fuel-Efficient Vehicles Rule). On September 19, 2019, USEPA and NHTSA issued a final action on the One National Program Rule, which is considered to be the first part of the Safer Affordable Fuel-Efficient Vehicles Rule and a precursor to the proposed fuel efficiency standards. The One National Program Rule enables USEPA and NHTSA to issue nationwide uniform fuel economy and GHG vehicle standards, specifically by (1) clarifying that federal law preempts state and local tailpipe GHG standards, (2) affirming NHTSA’s statutory authority to set nationally applicable fuel economy standards, and (3) withdrawing California’s federal Clean Air Act preemption waiver to set state-specific standards.

USEPA and NHTSA published their decisions to withdraw California’s waiver and finalize regulatory text related to the preemption on September 27, 2019 (84 *Federal Register* 51310). The agencies also announced that they will publish the second part of the Safer Affordable Fuel-Efficient Vehicles Rule (i.e., the standards) in October 2019. California, 22 other states, the District of Columbia, and two cities filed suit against the proposed One National Program Rule on September 20, 2019, in the U.S. District Court for the District of Columbia (*California et al. v. United States Department of Transportation et al.*, Case Number 1:19-cv-02826). The lawsuit requests “permanent injunction prohibiting Defendants from implementing or relying on the Preemption Regulation.” The fate of the One National Program Rule and Safer Affordable Fuel-Efficient Vehicles Rule remains uncertain in the face of pending litigation.

**Resource Conservation and Recovery Act (42 U.S.C. § 6901 et seq.)**

The Resource Conservation and Recovery Act (RCRA) was enacted in 1976 to oversee proper management of solid and hazardous wastes, from their generation to ultimate disposal or destruction. Implementation of the RCRA has largely been delegated to federally approved state waste management programs and, under Subtitle D, further promulgated to local governments for management of planning, regulation, and implementation of nonhazardous solid waste disposal. The USEPA retains oversight of state actions under 40 Code of Federal Regulations (C.F.R.) Parts 239–259. Where facilities are found to be inadequate, 40 C.F.R. Section 256.42 requires that necessary facilities and practices be developed by the responsible state and local agencies or by the private sector. In California, that responsibility was created under the California Integrated Waste Management Act of 1989 and Assembly Bill (AB) 939.

**Toxic Substances Control Act (15 U.S.C. § 2601 et seq.)**

The Toxic Substance Control Act of 1976 addresses the production, importation, use, and disposal of specific chemicals including asbestos and lead-based paints. This act requires the testing and safe disposal of any debris that contains asbestos or lead.

### *3.6.2.2 State*

**Public Utilities Code Sections 1001–1013 and California Public Utilities Commission General Order 131-D**

The California Public Utilities Commission (CPUC) regulates public electric utilities in California. Sections 1001–1013 of the Public Utilities Code require that railroad companies operating railroads primarily powered by electric energy or electric companies operating power lines not begin construction of electric railroads or power lines without first obtaining a certificate from the CPUC specifying that such construction is required for the public’s convenience and necessity. General Order 131-D establishes CPUC rules for implementing Public Utilities Code Sections 1001–1013 relating to the planning and construction of electric generation, transmission/power/distribution line facilities, and substations in California. A permit to construct must be obtained from CPUC for facilities between 50 kV and 200 kV. A certificate of public convenience and necessity (CPCN) must be obtained from the CPUC for facilities 200 kV and above. Both the permit to construct and CPCN are discretionary decisions by CPUC that are subject to the California Environmental Quality Act (CEQA).

**Designation of Transmission Corridor Zones (California Code of Regulations, Tit. 20, §§ 2320–2340)**

The regulation on Designation of Transmission Corridor Zones specifies the scope and process required for identification, evaluation, and designation of new transmission corridor zones.

**Energy Efficiency Standards (California Code of Regulations, Tit. 24, Part 6)**

The Energy Efficiency Standards promote efficient energy use in new buildings constructed in California. The standards regulate energy consumed for heating, cooling, ventilation, water heating, and lighting. The standards are enforced through the local building permit process.

**Renewables Portfolio Standard Program (SB 1078)**

The Renewables Portfolio Standard (RPS) Program requires retail sellers of electricity to increase their purchases of electricity generated by renewable sources and establishes a goal of having 20 percent of California's electricity generated by renewable sources by 2017. In 2010, the California Air Resources Board (CARB) extended this target for renewable energy resource use to 33 percent of total use by 2020 (CPUC 2017). In October 2015, Governor Edmund G. Brown, Jr. signed Senate Bill (SB) 350, which requires retail sellers and publicly owned utilities to procure 50 percent of their electricity from eligible renewable energy resources by 2030. Increasing California's renewable supplies will diminish the state's heavy dependence on natural gas as a fuel for electric power generation.

**100 Percent Clean Energy Act (SB 100)**

SB 100, the 100 Percent Clean Energy Act of 2018, makes it a policy of the state that eligible renewable energy resources and zero-carbon resources supply 100 percent of all retail sales of electricity to California end-use customers and 100 percent of electricity procured to serve all state agencies by December 31, 2045.

**Integrated Waste Management Act (AB 939)**

The California Integrated Waste Management Act of 1989 was enacted by AB 939 in response to the RCRA. It requires cities and counties to prepare an integrated waste management plan, including a countywide siting element (CSE), for each jurisdiction. Per California Public Resources Code Sections 41700–41721.5, the CSE provides an estimate of the total permitted disposal capacity needed for a 15-year period, or whenever additional capacity is necessary. CSEs in California must be updated by each operator and permitted by Department of Resources Recycling and Recovery, which is within the Natural Resources Agency, every 5 years. AB 939 mandated that local jurisdictions meet solid waste diversion goals of 50 percent by 2000.

**Sustainable Communities and Climate Protection Act of 2008 (SB 375, Chapter 728, Statutes of 2008)**

Adopted in September 2008, SB 375 provides a new planning process to coordinate community development and land use planning with regional transportation plans in an effort to reduce sprawling land use patterns and dependence on private vehicles and thereby reduce vehicle miles traveled (VMT) and GHG associated with VMT. SB 375 is one major tool being used to meet the goals in the Global Warming Solutions Act (AB 32). Under SB 375, CARB sets GHG emission reduction targets for 2020 and 2035 for the metropolitan planning organizations in the state. Each metropolitan planning organization must then prepare a sustainable communities strategy that meets the GHG emission reduction targets set by CARB. The sustainable communities strategy has been incorporated into the region's regional transportation plan.

**Local Government Construction and Demolition Guide (SB 1374)**

SB 1374 seeks to assist jurisdictions with diverting construction and demolition (C&D) material, with a primary focus on the California Department of Resources Recycling and Recovery

(CalRecycle), by developing and adopting a model C&D diversion ordinance for voluntary use by California jurisdictions.

**Protection of Underground Infrastructure (California Government Code § 4216)**

Protection of Underground Infrastructure code requires that an excavator must contact a regional notification center (i.e., underground service alert) at least 2 days before excavation of any subsurface installations. The underground service alert then notifies utilities that may have buried lines within 1,000 feet of the excavation. Representatives of the utilities must mark the specific location of their facilities within the work area prior to the start of excavation. The construction contractor must probe and expose the underground facilities by hand prior to using power equipment.

**California Public Utilities Commission General Order 95**

The CPUC General Order, Rule for Overhead Electric Line Construction, formulates uniform requirements for overhead electrical line construction, including overhead catenary construction, the application of which provides for adequate service and safety to persons engaged in the construction, maintenance, operation, or use of overhead electrical lines and to the public in general.

**Water Conservation Act of 2009 (SB X7-7)**

The Water Conservation Act of 2009 (SB X7-7) requires urban and agricultural water suppliers to increase water use efficiency. The urban water use goal within the state is to achieve a 20 percent reduction in per capita water use by December 31, 2020. Agricultural water suppliers should have prepared and adopted agricultural water management plans by December 31, 2012, were required to update those plans by December 31, 2015, and are required to update those plans every 5 years thereafter. Effective 2013, agricultural water suppliers who do not meet the water management planning requirements established by this bill are not eligible for state water grants or loans.

**Clean Energy and Pollution Reduction Act of 2015**

The Clean Energy and Pollution Reduction Act of 2015 establishes targets to increase the RPS to 50 percent by 2030 from the retail sales of renewable electricity. The California Energy Commission (CEC) is involved in many efforts to promote and support renewable energy development. These efforts include requiring utilities to disclose their electricity supply portfolio to consumers, funding solar photovoltaic installations on new single-family and multifamily homes, distributing renewable energy conservation planning grants to local governments, providing incentives for the development of geothermal resources, addressing barriers to bioenergy development, and tracking the state's progress toward its renewable goals.

**Urban Water Management Planning Act (California Water Code, §§ 10610–10656)**

The Urban Water Management Planning Act (California Water Code, Division 6, Part 2.6, §§ 10610–10656) requires the preparation of an urban water management plan every 5 years by water suppliers that provide over 3,000 acre-feet of water annually or serve water for municipal purposes either directly or indirectly to 3,000 or more customers.

**Sustainable Groundwater Management Act**

California depends on groundwater for a major portion of its annual water supply, and sustainable groundwater management is essential to a reliable and resilient water system. In September 2014, Governor Brown enacted the Sustainable Groundwater Management Act, which empowers local agencies to adopt groundwater management plans that are tailored to the resources and needs of their communities. The intent of good groundwater management is to provide a buffer against drought and climate change and to contribute to reliable water supplies regardless of weather patterns.

**Waste Management for State Agencies (AB 75)**

This California state law, adopted in 1999, requires each state agency and each large state facility, as defined, to divert at least 50 percent of the waste it generates. Agencies must also designate at least one solid waste reduction and recycling coordinator to oversee the implementation of waste management plans and recycling or reuse programs and submit an annual report, for the prior calendar year, including disposal amounts and explanation of diversion activities. Reports are due by May 1 of each year. The business services manager at the Authority is the designated coordinator.

**California Regional Water Quality Management Plans**

Division Seven (Water Quality) of the State Water Code establishes the responsibilities and authorities of the nine Regional Water Quality Control Boards (RWQCB) and the State Water Resources Control Board. The Porter-Cologne Water Quality Control Act names these Boards “the principal State agencies with primary responsibility for the coordination and control of water quality” (§ 13001). Each RWQCB is directed to “formulate and adopt water quality control plans for all areas within the region.” The RWQCBs implement the basin plans by issuing and enforcing waste discharge requirements to individuals, communities, or businesses whose waste discharges can affect water quality. These requirements can be either state waste discharge requirements for discharges to land, or federally delegated National Pollutant Discharge Elimination System (NPDES) permits for discharges to surface water. Methods of treatment are not specified. When such discharges occur, they are managed so that (1) they meet these requirements; (2) water quality objectives are met; and (3) beneficial uses are protected, and water quality is controlled (Central Coast RWQCB 2019; Central Valley RWQCB 2018; San Francisco Bay RWQCB 2017).

### *3.6.2.3 Regional and Local*

Volume 2, Appendix 2-I lists all regional and local policies that are applicable to the project. These policies include sustainable communities strategies that accompany regional transportation plans, county and city general plans, urban water management plans, and countywide integrated waste management plans. In addition to these plans, a local coalition of the Clean Cities Program has been established within the region.

**Clean Cities Program**

The U.S. Department of Energy’s Clean Cities program was established to advance the nation’s economic, environmental, and energy security by supporting local actions to reduce petroleum use in transportation. The Silicon Valley Clean Cities Coalition, located in Santa Clara County, builds partnerships with local and statewide organizations in the public and private sectors to advance the use of alternative and renewable fuels, idle-reduction measures, fuel economy improvements, and new transportation technologies (Silicon Valley Clean Cities n.d.; U.S. Department of Energy n.d.).

## 3.6.3 Consistency with Plans and Laws

As indicated in Section 3.1.5.3, Consistency with Plans and Laws, CEQA and Council on Environmental Quality (CEQ) regulations require a discussion of inconsistencies or conflicts between a proposed undertaking and federal, state, regional, or local plans and laws. Accordingly, this Draft EIR/EIS describes the inconsistency of the project alternatives with federal, state, regional, and local plans and laws to provide planning context.

There are a number of federal and state laws and implementing regulations listed in Section 3.6.2.1, Federal, and Section 3.6.2.2, State, that direct the use of public utilities and energy. A summary of the federal and state requirements considered in this analysis follows:

- Acts and orders applicable to the conservation of petroleum, natural gas, and water include the Power Plan and Industrial Fuel Use Act of 1978, USEO 12185, and the Conservation of Petroleum and Natural Gas, and the Water Conservation Act of 2009.

- Acts and orders applicable to the safe transmission of hazardous material, natural gas, oil, and electricity include the Norman Y. Mineta Research and Special Programs Improvement Act and FERC regulations. The RCRA provides for the proper management of solid and hazardous wastes, from their generation to ultimate disposal or destruction.
- Federal and state initiatives to reduce energy consumed and GHG emissions from motor vehicles include the CAFE standards, Pavley Rule, and Sustainable Communities and Climate Protection Act of 2008.
- The Public Utilities Code regulates public electric utilities in California. California Code of Regulations, Title 24, Part 6, and Part 11, Energy Efficiency Standards promotes efficient energy use in new buildings constructed in California.
- The Integrated Waste Management Act regulates generation and disposal of waste in California, and mandates a reduction of waste being disposed. The Local Government Construction and Demolition Guide assists jurisdictions with diverting their C&D material, with a primary focus on CalRecycle.
- The RPS Program requires retail sellers of electricity in California to increase their purchases of electricity generated by renewable sources.
- Prior to excavation of any subsurface installation in California, the excavator must contact a regional notification center per the Protection of Underground Infrastructure.
- CPUC General Order 176 and General Order 95 regulate overhead electric line construction in California.

The Authority, as the lead agency proposing to construct and operate the HSR system, must comply with all federal and state laws and regulations, and secure all applicable federal and state permits prior to initiating construction on the selected alternative. Therefore, there would be no inconsistencies between the project alternatives and these federal and state laws and regulations.

The Authority is a state agency and, therefore, is not required to comply with local land use and zoning regulations; however, the Authority has endeavored to design and build the HSR project so that it is consistent with land use regulations. For example, the project alternatives would incorporate IAMFs to minimize impacts on public utilities and energy. The Authority reviewed a total of 59 regional and local plans and municipal codes including 222 goals, policies, and objectives (listed in Volume 2, Appendix 2-I), and determined that overall the project would be consistent with the local goals, policies, and objectives related to energy efficiency, water conservation, solid waste reduction, and reliable utility service because the project would provide energy-efficient transportation and would protect utility service during construction and operation. Thus, the project would have no inconsistencies with local goals, policies, and objectives.

## 3.6.4 Methods for Evaluating Impacts

The National Environmental Policy Act (NEPA) and CEQA require evaluation of impacts on public utilities and energy. The following sections define the RSAs and summarize the methods used to analyze impacts on public utilities and energy. As summarized in Section 3.6.1, Introduction, five other resource sections in this Draft EIR/EIS also provide additional information related to public utilities and energy.

### *3.6.4.1 Definition of Resource Study Area*

As defined in Section 3.1, Introduction, RSAs are the geographic boundaries in which the Authority conducted the environmental investigations specific to each resource topic. There are two RSAs for public utilities and energy, one for public utilities and one for energy resources. The RSA for impacts on public utilities and the RSA for impacts on energy resources encompass the infrastructure and service areas of public utilities and energy sources, respectively, that construction and operation of the project could directly and indirectly affect. The RSA for direct impacts includes the entire project footprint on or across public utilities and energy infrastructure, including surface, subsurface, and overhead utilities. The RSA for indirect impacts includes the area that would extend beyond the project footprint, including areas where utility relocations, use of non-HSR utility and energy resources and facilities necessary for project construction and operation, and construction of electrical interconnections with local utilities would occur. Table 3.6-1 describes specific RSA boundaries for public utilities and energy resources.

**Table 3.6-1 Definition of Public Utilities and Energy Resource Study Area**

| Type | General Definition |
|---|---|
| **Public Utilities** | |
| Utility-owned properties and facilities including major public utility infrastructure and facilities required for connecting to the HSR system. Facilities could include substations; easements; overhead utility lines (e.g., telephone, cable television); and buried utility lines (e.g., electricity, water, wastewater, stormwater, natural gas lines, petroleum product lines). | The RSA for direct impacts includes the entire project footprint on or across public utilities and energy infrastructure, including surface, subsurface, and overhead utilities, which include stormwater and water supply lines, electricity transmission facilities, natural gas and petroleum product pipelines, fiber optics, and communication facilities.<br>The RSA for indirect impacts includes the area that would extend beyond the project footprint, including impacts of utility relocations or use of non-HSR resources and facilities necessary for project construction and operations, and construction of electrical interconnections with local utilities required for connecting to the HSR system. |
| Wastewater treatment facilities | San Francisco County, San Mateo County, Santa Clara County, City of Santa Clara, City of San Jose |
| Stormwater management facilities | San Francisco County, San Mateo County, Santa Clara County, City of Santa Clara, City of San Jose |
| Solid waste management facilities | San Francisco County, San Mateo County, Santa Clara County, City of Santa Clara, City of San Jose |
| Hazardous waste management facilities[1] | Kings County, Kern County, Imperial County |
| **Energy Resources** | |
| Electricity generation and transmission systems required for connecting to the HSR system, as well as changes in petroleum consumption for vehicle and plane travel and electrical, natural gas, and petroleum consumption demands from construction and operation of the HSR and its associated facilities. | Infrastructure and service areas of energy resource providers. Includes the project footprint and areas within and beyond the project footprint, including the electricity grid in the entire state of California and other western states that produce energy exported to California.[2] |

HSR = high-speed rail
RSA = resource study area
[1] There are no licensed hazardous waste disposal facilities in Santa Clara, San Benito, or Merced Counties. There are three licensed hazardous waste disposal facilities in California, one in Kern County, one in King County, and one in Imperial County.
[2] The HSR system would obtain electricity from the statewide grid. Therefore, this analysis cannot apportion to a particular regional study area the use of any particular generation facilities.

### 3.6.4.2 Impact Avoidance and Minimization Features

IAMFs are project features that are considered to be part of the project and are included as applicable in each of the alternatives for purposes of the environmental impact analysis. The full text of the IAMFs that are applicable to the project is provided in Volume 2, Appendix 2-E. The following IAMFs are applicable to the public utilities and energy analysis.

- PUE-IAMF#1: Design Measures
- PUE-IAMF#3: Public Notifications
- PUE-IAMF#4: Utilities and Energy
- BIO-IAMF#1: Project Biologist
- GEO-IAMF#1: Geologic Resources
- HMW-IAMF#5: Demolition Plans
- HMW-IAMF#7: Transport of Materials
- HMW-IAMF#8: Permit Conditions
- HMW-IAMF#10: Hazardous Materials Plans
- HYD-IAMF#1: Stormwater Management
- HYD-IAMF#2: Flood Protection
- HYD-IAMF#3: Prepare and Implement a Construction Stormwater Pollution Prevention Plan
- HYD-IAMF#4: Prepare and Implement an Industrial Stormwater Pollution Prevention Plan
- SS-IAMF#2: Safety and Security Management Plan

This environmental impact analysis considers these IAMFs as part of the project design. In Section 3.6.6, Environmental Consequences, each impact narrative describes how these project features are applicable and, where appropriate, effective at avoiding or minimizing the impact to less than significant under CEQA.

### 3.6.4.3 Methods for Impact Analysis

#### Overview of Impact Analysis

This section describes the sources and methods used to analyze potential project impacts on public utilities and energy. These methods apply to both NEPA and CEQA analyses unless otherwise indicated. Refer to Section 3.1.5.4, Methods for Evaluating Impacts, for a description of the general framework for evaluating impacts under NEPA and CEQA.

#### *Public Utilities*

The public utilities section assesses the impact construction of the project would have on public utilities in the RSA and the ability of public utility providers and facilities to meet new demand for utility services, such as electricity, water, wastewater, and solid waste disposal, resulting from construction and operation of the project.

*Public Utilities Analysis Evaluates:*

- Planned and accidental utility service interruptions during construction
- Temporary and permanent conflicts with existing utility lines within the RSA
- Demand for utility services for construction and operation including water, wastewater, stormwater, and solid waste

**Construction Impacts**

The Authority has engaged at the local level with public utility operators and local agencies since 2009 to identify public utilities in the RSA and to conduct early coordination to minimize potential utility conflicts. The Authority reviewed utility corridor maps, as-built drawings, and encroachment requirements provided by utility providers to determine the type, size, and location of existing utility infrastructure within the public utilities RSA. Specialists mapped the locations of public utilities, including natural gas, petroleum and fuel pipelines, electric transmission lines, water lines, wastewater and stormwater management lines, and communications facilities within the public utility RSA, using geographic information systems. The Authority then quantified impacts on major utilities (defined in Section 3.6.1) by counting each time the utility crosses the project alternatives, and determined whether the conflicting utilities would require relocation or could be protected in place. Volume 2, Appendix 3.6-A provides information on the individual utility conflicts in the public utilities RSA.

The Authority estimated construction water use for the project based on a construction period concluding in 2026. Water would be used during construction for manufacturing of concrete, placement of concrete, earthwork, dust control, and landscaping. Estimates were developed for construction water use based on the number of water trucks that have been estimated to be required during construction (Authority 2019a). Volume 2, Appendix 3.6-C provides additional discussion of the methodology and analysis prepared as part of the water use assessment. Section 3.8 provides additional detail regarding surface and groundwater supplies and quality, stormwater management, and hydrology.

The Authority's engineers provided estimates of the amount of vegetation clearing, removal of existing asphalt and gravel, and demolition of existing structures to calculate the amount of solid waste generated by C&D activities. These estimates took into consideration the existing characteristics of the public utilities RSA including the approximate square footage of structures that would be demolished for construction of the project and the amount of cut-and-fill profile.

#### Operations Impacts

The Authority estimated operational water consumption and solid waste generation based on typical rates for the three modified HSR station facilities and the light maintenance facility (LMF) and assumed wastewater generation for operation of the three modified HSR stations and Brisbane LMF to be 100 percent of total water demand during operations.[1] To evaluate the potential need for new infrastructure (water supply, wastewater, waste management infrastructure), the Authority compared the water consumption, wastewater generation, and solid and hazardous waste generation estimates for the project to the anticipated remaining water supply, wastewater treatment capacity, and solid waste (including hazardous waste) disposal capacity.

### *Energy*

As described in Section 3.6.1, transportation energy is generally discussed in terms of direct and indirect energy. Energy impacts caused by the project would be comprised of the additional consumption of electricity to power the HSR system (direct use) and consumption of resources to build the proposed HSR facilities (indirect use).

*Energy Resources Analysis Evaluates:*

- Construction energy demand
- Peak electricity demand during construction
- Operation energy demand
- Peak electricity demand during operation
- Regional and statewide energy consumption for transportation modes
- Ancillary energy consumption for operations

#### Construction Impacts

Indirect energy consumption involves the nonrecoverable, one-time energy expenditure required to build the physical infrastructure associated with the project alternatives. The Authority estimated construction energy use for the project based on an anticipated 4.5-year construction period concluding in 2026 and estimates for the required types and quantities of construction equipment. Energy would be used during construction, primarily in the form of fuel (gasoline and diesel) consumption for operation of construction vehicles and equipment for structural work, placement of concrete, earthwork, dust control, and landscaping. The electricity for lighting for the project site would be generated by portable generators that would use fuel.

#### Operations Impacts

The project and the proposed HSR system would obtain electricity from the statewide electricity grid. To identify the projected energy demand of the project, the estimated electrical requirements of the HSR system were prorated based on the proportion of the length of HSR guideway in the Project Section. Phase 1 of the HSR system would be approximately 520 miles long. The length of the project

[1] This provides a conservative estimate since the actual wastewater generation during operation is not yet known.

is approximately 49 miles, or approximately 9 percent of the full HSR system, and consequently would consume approximately 9 percent of the electrical requirements of the HSR system.

In calculating estimated energy savings for the project alternatives, two ridership probability scenarios were used: medium and high. These scenarios are based on probabilistic estimates for Phase I of the HSR system to achieve its ridership projections by 2040. In the case of HSR, *probabilistic* is defined as numerous possible ridership outcomes, each having varying degrees of certainty or uncertainty of occurring. More detailed discussions of travel demand and ridership forecasts are presented in Sections 2.6.1, Travel Demand and Ridership Forecasts, and 3.1.5.6, Environmental Consequences.

Energy used for vehicle propulsion is a function of traffic characteristics and the thermal value of the fuel used. The Authority derived petroleum consumption rates for vehicle travel from the travel demand forecast for the HSR and growth projections performed by the CEC. These consumption rates were used to determine the amount of petroleum used for transportation under the No Project Alternative and the project alternatives. Current electricity consumption rates from the CEC were then compared with the projected energy consumption of the HSR system. Refer to Volume 2, Appendix 3.6-D for additional information regarding the methodology for determining projected energy consumption of the HSR system.

The construction energy payback period measures the number of years required to pay back the energy used in construction with the operational energy consumption savings of the project alternatives. The Authority calculated the payback period by dividing the estimated HSR system construction energy by the amount of energy that the HSR system would later save (based on the prorated statewide value). The calculations assume that the amount of energy saved in the study years (2015 and 2040) would remain constant throughout the payback period.

#### *3.6.4.4 Method for Evaluating Impacts under NEPA*

CEQ NEPA regulations (40 C.F.R. Parts 1500–1508) provide the basis for evaluating project effects (as described in Section 3.1.5.4). As described in Section 1508.27 of these regulations, the criteria of context and intensity are considered together when determining the severity of the change introduced by the project.

**Context**—For this analysis, the *context* for the proposed project's effect on public utilities and energy would include the following:

- The regulatory setting pertaining to public utilities, including CAFE standards, regulations set by FERC and CPUC, local utility and energy-related ordinances and standards, and integrated waste management plans
- The regional and local regulatory setting pertaining to energy, including regional, county, and municipal general plans, transportation plans, renewable energy standards, and local GHG management plans and policies
- The statewide electricity generation and distribution system that would provide electric power for construction and operation of the HSR system
- The number of users and importance of various modes of the transportation system, including vehicle (automobile and bus) and airplane transportation
- The utility system, its relationship to project alternatives, and the number of potential disruptions by the HSR

**Intensity**—This analysis determines *intensity* by assessing the following:

- The project's effect on demand for public utility services and energy
- Any potential violation by the project of federal, state, or local law or requirements imposed for the protection of the environment

- The degree to which possible effects related to public utilities and energy are uncertain or involve unknown risks, which could occur if the project would result in an exceedance of existing and planned capacity of public utilities and energy providers

#### 3.6.4.5 Method for Determining Significance under CEQA

The Authority is using the following thresholds to determine if a significant impact on public utilities and energy would occur as a result of the project alternatives. For the CEQA analysis, the project would result in a significant impact on public utilities if it would:

- Require or result in the relocation or construction of new or expanded water, wastewater treatment or stormwater drainage, electric power, natural gas, or telecommunications facilities, the construction or relocation of which could cause significant environmental effects
- Have insufficient water supplies available to serve the project and reasonably foreseeable future development during normal, dry, and multiple dry years
- Result in a determination by the wastewater treatment provider which serves or may serve the project that it has inadequate capacity to serve the project's projected demand in addition to the provider's existing commitments
- Generate solid waste in excess of state or local standards, or in excess of the capacity of local infrastructure or otherwise impair the attainment of solid waste reduction goals
- Fail to comply with federal, state, and local management and reduction statutes related to solid waste

Low-impact conflicts would occur if the project would cross or conflict with distribution pipelines or electrical power lines, which are easier to avoid, relocate, or protect in place. Low-impact conflicts involving utilities are considered less-than-significant impacts on utilities and service systems because these types of utilities and service systems would be temporarily affected, typically only during a brief relocation period. Construction work that could result in temporary interruption of utility services would be conducted in coordination with the utility provider and with prior public notification, and utility service levels would remain unchanged after construction work is completed. Environmental consequences related to utility relocations are described in detail in Section 3.6.6.

For purposes of analysis for this Draft EIR/EIS, the Authority is using the following additional criteria as thresholds of significance. For this analysis, the project would result in a significant impact on public utilities and energy if it would:

- Require or result in the construction of new electrical facilities or expansion and upgrade of existing facilities, the construction of which could cause significant environmental effects
- Conflict with a major nonlinear fixed facility, such as an electrical substation or wastewater treatment plant (WWTP), the relocation of which could cause a lengthy and harmful interruption of service
- Conflict with a major linear nonfixed facility, such as major stormwater transmission main or gas/electricity transmission facility, the reconstruction or relocation of which could cause a lengthy and harmful interruption of service

According to Appendix F of the CEQA Guidelines, EIRs must discuss the potential energy impacts of proposed projects, with particular emphasis on avoiding or reducing inefficient, wasteful, and unnecessary consumption of energy. Wise and efficient use of energy may include decreasing overall per capita energy consumption; decreasing reliance on fossil fuels such as coal, natural gas and oil; and increasing reliance on renewable energy sources. Accordingly, for this analysis, the project would have a potentially significant impact on energy use, including energy conservation, if it would:

- Result in potentially significant environmental impacts due to wasteful, inefficient, or unnecessary consumption of energy resources, during project construction or operation

- Conflict with or obstruct a state or local plan for renewable energy or energy efficiency
- Place a substantial demand on regional energy supply or require substantial additional capacity or substantially increase peak and base period electricity demand

By contrast, if the proposed project results in energy savings, alleviates demand on energy resources, or encourages the use of efficient transportation alternatives, it would have a beneficial effect.

### 3.6.5 Affected Environment

This section describes the affected environment for public utilities and energy in their RSAs, including the existing public utilities and energy providers and infrastructure; and energy sources, supply, demand, and transmission. This information provides the context for the environmental analysis and evaluation of impacts.

Table 3.6-2 provides a summary of the utility and energy providers within the public utilities and energy RSAs. Although each of these providers deliver utility and energy services within the RSA, not all of these providers have major utilities (defined in Section 3.6.1) in the RSA. The subsequent text and figures focus on the major public utilities in the RSAs, including facilities for electricity, natural gas, petroleum, telecommunications, potable water, stormwater, wastewater, and solid waste.

**Table 3.6-2 Summary of Utility and Energy Providers in the Resource Study Areas**

| Utility Type | County/City Location | Provider |
|---|---|---|
| Electrical | San Francisco, San Mateo, and Santa Clara Counties | PG&E |
| | City and County of San Francisco | SFPUC |
| | City of Palo Alto | City of Palo Alto Utility |
| | City of Santa Clara | Silicon Valley Power |
| | City of San Jose | Calpine |
| Natural gas | San Francisco, San Mateo, and Santa Clara Counties | PG&E |
| | City of Palo Alto | City of Palo Alto Utility |
| | Santa Clara County | CPN |
| | | Silicon Valley Power |
| Petroleum and fuel pipelines | City and County of San Francisco | Kinder Morgan |
| Communications | San Francisco, San Mateo, and Santa Clara Counties | MCI |
| | | Sprint |
| | | AT&T |
| | | Qwest |
| | | Brook Fiber |
| | | Level 3 |
| | | Pacific Bell |
| | Santa Clara County | T-Mobile |
| | | Sprint |

| Utility Type | | County/City Location | Provider |
|---|---|---|---|
| | | | Century Link/Level 3 Communications |
| | | | Century Link/QWEST |
| Water supply | Potable (supply) | City and County of San Francisco | SFPUC |
| | | County of San Mateo | |
| | | City of Brisbane | |
| | | City of South San Francisco | |
| | | City of San Bruno | |
| | | City of Millbrae | |
| | | City of Burlingame | |
| | | City of San Mateo | |
| | | City of Belmont | |
| | | City of San Carlos | |
| | | City of Redwood City | |
| | | Town of Atherton | |
| | | City of Menlo Park | |
| | | County of Santa Clara | |
| | | City of Palo Alto | |
| | | City of Mountain View | |
| | | City of Sunnyvale | |
| | | City of Santa Clara | |
| | | Santa Clara County | Santa Clara Valley Water District |
| | | City of Santa Clara | City of Santa Clara Water Utility |
| | | City of San Jose | San Jose Water Company |
| | | | Great Oaks Water Company |
| | | | San Jose Municipal Water System |
| | Potable (distribution) | City and County of San Francisco | SFPUC |
| | | City of Brisbane | City of Brisbane Public Works Department |
| | | City of San Bruno | City of San Bruno Public Works Department |
| | | City of Millbrae | City of Millbrae Public Works Department |
| | | City of Burlingame | City of Burlingame Public Works Department |
| | | City of South San Francisco | California Water Services Company |
| | | City of San Mateo | |

| Utility Type | | County/City Location | Provider |
|---|---|---|---|
| | | City of Belmont | |
| | | City of San Carlos | |
| | | Town of Atherton | |
| | | City of Redwood City | City of Redwood City Public Works Department |
| | | City of Menlo Park | City of Menlo Park Public Works Department |
| | | City of Palo Alto | City of Palo Alto Public Works Department |
| | | City of Mountain View | City of Mountain View |
| | | City of Sunnyvale | City of Sunnyvale |
| | | City of Santa Clara | City of Santa Clara Public Works Department |
| | | City of San Jose | San Jose Water Company |
| | | | Great Oaks Water Company |
| | | | San Jose Municipal Water System |
| | Recycled water | City and County of San Francisco | SFPUC |
| | | City of Millbrae | City of Millbrae Public Works Department |
| | | City of Redwood City | City of Redwood City Public Works Department |
| | | City of Palo Alto | City of Palo Alto Public Works Department |
| | | City of Mountain View | City of Mountain View |
| | | City of Sunnyvale | City of Sunnyvale |
| | | City of Santa Clara | South Bay Water Recycling |
| | | City of San Jose | South Bay Water Recycling |
| Wastewater collection and treatment | | City and County of San Francisco | SFPUC |
| | | City of Brisbane | SFPUC |
| | | City of South San Francisco | City of South San Francisco |
| | | City of San Bruno | City of South San Francisco |
| | | City of Millbrae | City of Millbrae |
| | | City of Burlingame | City of Burlingame |
| | | City of San Mateo | City of San Mateo |
| | | County of San Mateo | City of Redwood City |
| | | City of Belmont | |
| | | City of San Carlos | |

| Utility Type | County/City Location | Provider |
|---|---|---|
| | City of Redwood City | |
| | Town of Atherton | |
| | City of Menlo Park | |
| | City of Palo Alto | City of Palo Alto |
| | City of Mountain View | |
| | City of Sunnyvale | City of Sunnyvale |
| | City of Santa Clara | City of Santa Clara and San Jose |
| | Santa Clara County | Municipal service providers; on-site wastewater treatment systems in unincorporated areas |
| | City of Santa Clara | City of Santa Clara Sewer Utility |
| | | San Jose/Santa Clara Regional Wastewater Facility |
| | City of San Jose | City of San Jose Environmental Services Department |
| | | San Jose/Santa Clara Regional Wastewater Facility |
| Stormwater management | City and County of San Francisco | SFPUC |
| | County of San Mateo | County of San Mateo Public Works |
| | City of Brisbane | City of Brisbane Public Works |
| | City of South San Francisco | City of South San Francisco Public Works Department |
| | City of San Bruno | City of San Bruno Public Works Department |
| | City of Millbrae | City of Millbrae Public Works Department |
| | City of Burlingame | City of Burlingame Public Works Department |
| | City of San Mateo | City of San Mateo Public Works Department |
| | City of Belmont | City of Belmont |
| | City of San Carlos | City of San Carlos Public Works Department |
| | City of Redwood City | City of Redwood City Public Works Department |
| | Town of Atherton | Town of Atherton Public Works Department |
| | City of Menlo Park | City of Menlo Park Public Works Department |
| | County of Santa Clara | County of Santa Clara |

| Utility Type | County/City Location | Provider |
|---|---|---|
| | City of Palo Alto | City of Palo Alto Public Works Department |
| | City of Mountain View | City of Mountain View |
| | City of Sunnyvale | City of Sunnyvale |
| | City of Santa Clara | City of Santa Clara Public Works Department |
| | Santa Clara County | Santa Clara County Clean Water Program |
| | City of San Jose | City of San Jose Department of Transportation |
| Solid waste disposal | Alameda County | Altamont |
| | | Vasco Road |
| | Contra Costa County | Acme |
| | | Keller Canyon |
| | | USS-Posco Industries Unit II |
| | Marin County | Redwood |
| | Napa County | Clover Flat Resource Recovery Park |
| | San Mateo County | Corinda Los Trancos Landfill (Ox Mountain Sanitary) |
| | Santa Clara County | Newby Island Sanitary Landfill |
| | | Kirby Canyon Recycling and Disposal Facility |
| | | Guadalupe Community Facility |
| | Solano County | Recology Hay Road |
| | | Potrero Hills |
| | Sonoma County | Central Disposal Site |
| Hazardous waste disposal facilities | Kings County | Waste Management, Kettleman Hills |
| | Kern County | Clean Harbors Facility, Buttonwillow |
| | Imperial County | Clean Harbors Facility, Westmorland |

PG&E = Pacific Gas and Electric Company
SFPUC = San Francisco Public Utilities Commission
The table includes public utilities and energy providers that are categorized as major utilities and identified in Appendix 3.6-A and also includes public utilities and energy providers in the resource study area that are not categorized as major utilities; non-major utilities are not identified in Volume 2, Appendix 3.6-A.

### 3.6.5.1 Public Utilities

Major public utilities within the public utility RSA include facilities for electricity, natural gas and petroleum distribution, telecommunications, water supply infrastructure (potable, recycled, and agricultural water), stormwater management structures including storm drains and canals, and sanitary sewer lines. Table 3.6-3 shows a summary by alternative and subsection of the major utilities within the public utility RSA for the project alternatives.

**Table 3.6-3 Major Utility Lines within the Public Utility Resource Study Area**

| Alternative/Subsection | Substations | Electrical Lines | Natural Gas | Petroleum and Fuel Pipelines | Communication Lines | Water Supply Infrastructure | Storm Drains and Canals | Sanitary Sewers |
|---|---|---|---|---|---|---|---|---|
| **Alternative A** | | | | | | | | |
| San Francisco to South San Francisco Subsection | 0 | 13 | 9 | 9 | 5 | 3 | 17 | 2 |
| San Bruno to San Mateo Subsection | 0 | 6 | 3 | 0 | 16 | 6 | 15 | 5 |
| San Mateo to Palo Alto Subsection | 0 | 8 | 4 | 0 | 2 | 3 | 7 | 4 |
| Mountain View to Santa Clara Subsection | 0 | 6 | 2 | 0 | 1 | 2 | 1 | 1 |
| San Jose Diridon Station Approach Subsection | 0 | 32 | 5 | 2 | 28 | 11 | 18 | 13 |
| **Alternative A Totals** | **0** | **65** | **23** | **11** | **52** | **25** | **58** | **25** |
| **Alternative B[1]** | | | | | | | | |
| San Francisco to South San Francisco Subsection | 0 | 11 | 7 | 7 | 7 | 2 | 17 | 2 |
| San Bruno to San Mateo Subsection | 0 | 6 | 3 | 0 | 16 | 6 | 15 | 5 |
| San Mateo to Palo Alto Subsection | 0 | 28 | 9 | 0 | 4 | 10 | 20 | 6 |
| Mountain View to Santa Clara Subsection | 0 | 6 | 2 | 0 | 1 | 2 | 1 | 1 |
| San Jose Diridon Station Approach Subsection | 2/1 | 8/7 | 1/0 | 0 | 11/9 | 4/3 | 10 | 9 |
| **Alternative B Totals** | **2/1** | **59/58** | **22/21** | **7** | **39/37** | **24/23** | **63** | **23** |

I- = Interstate
[1] Where applicable, values are presented for Alternative B (Viaduct to I-880) first, followed by Alternative B (Viaduct to Scott Boulevard). If only one value is presented, the value would be identical under both Alternative B viaduct options

### Electrical Transmission

Figure 3.6-1 through Figure 3.6-5 illustrate electric transmission lines, substations, and transmission towers within the public utilities RSA. As shown in Table 3.6-3, 65 major electrical utility lines cross or run parallel to Alternative A, while 59 major electrical utility lines cross or run parallel to Alternative B (Viaduct to Interstate [I-] 880) and 58 major electrical utility lines cross or run parallel to Alternative B (Viaduct to Scott Boulevard).

Pacific Gas and Electric Company (PG&E) provides electricity to much of Northern California, from approximately Bakersfield to the California-Oregon border. The company's generation portfolio includes hydroelectric facilities, a nuclear power plant, and a natural gas-fired power plant. PG&E provides electric service to most of the RSA. It generates electricity in facilities within several hundred miles of the points of use (CEC 2015a). PG&E operates and maintains the distribution system, except in the cities of Palo Alto and Santa Clara, which provide electricity for their customers through their own infrastructure.


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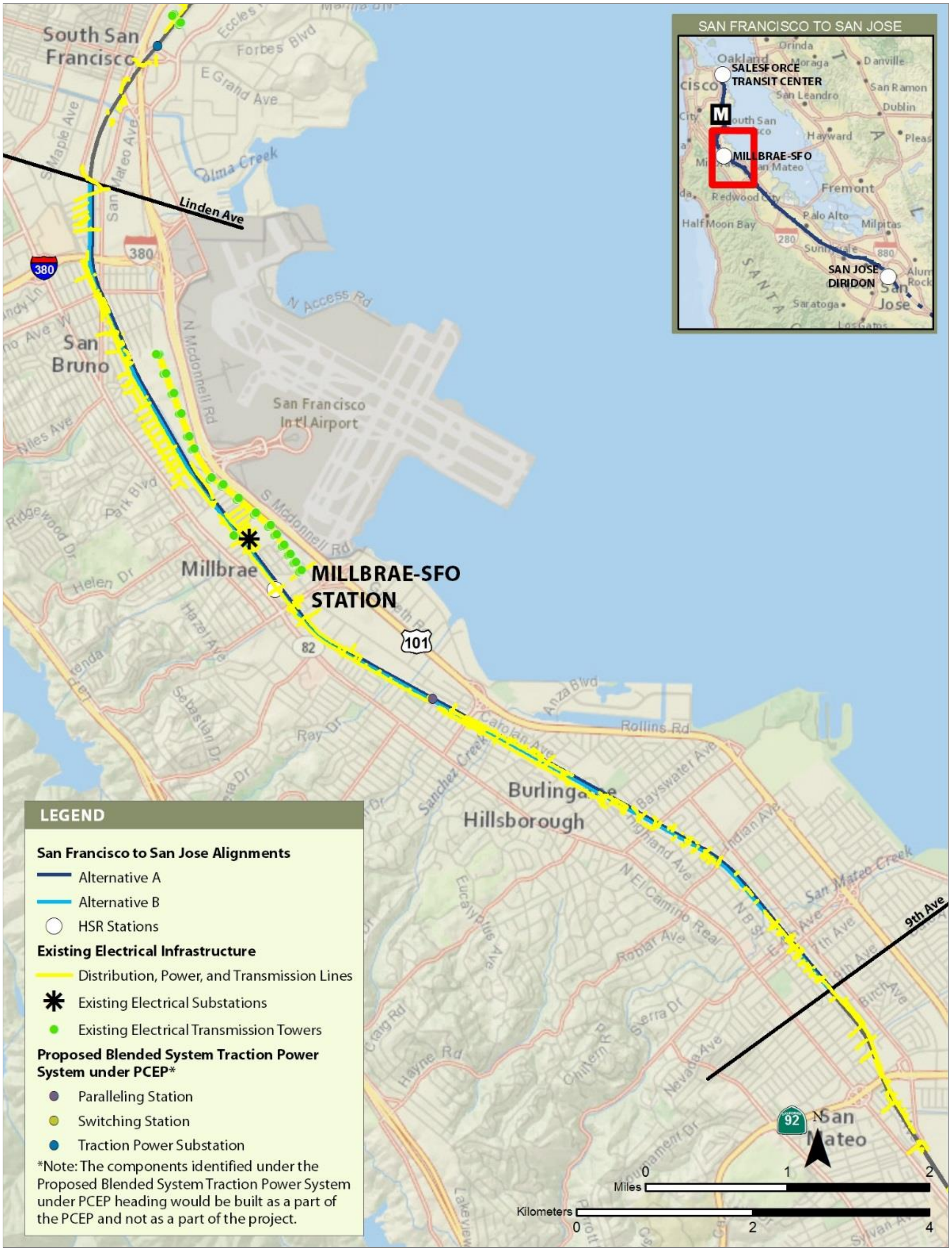
**Figure 3.6-1 Electric Distribution, Power, Transmission Lines, and Substations in the Resource Study Area—San Francisco to South San Francisco Subsection**




OCTOBER 2019

**Figure 3.6-2 Electric Distribution, Power, Transmission Lines, and Substations in the Resource Study Area—San Bruno to San Mateo Subsection**

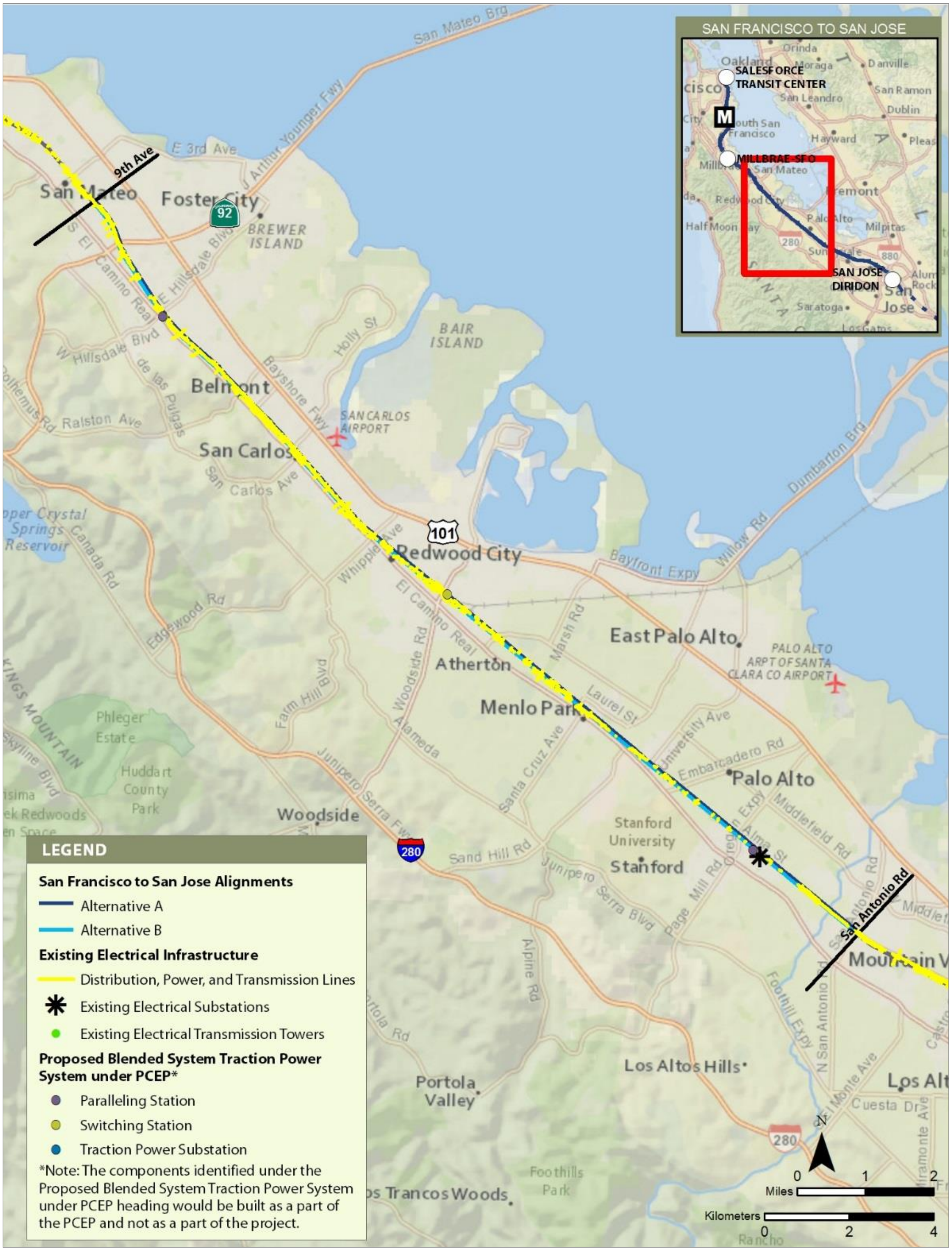
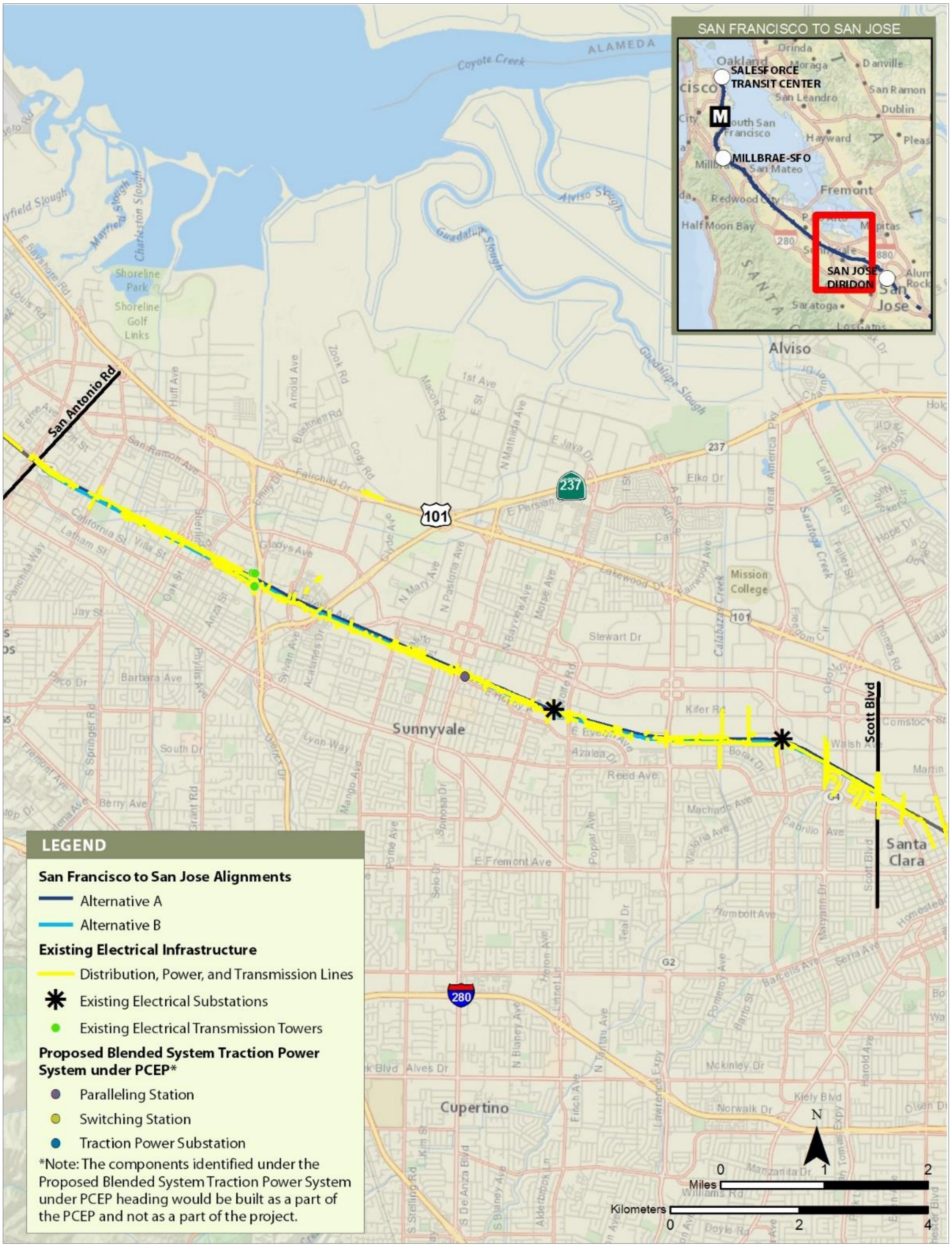



**Figure 3.6-3 Electric Distribution, Power, Transmission Lines, and Substations in the Resource Study Area—San Mateo to Palo Alto Subsection**




OCTOBER 2019

**Figure 3.6-4 Electric Distribution, Power, Transmission Lines, and Substations in the Resource Study Area—Mountain View to Santa Clara Subsection**


OCTOBER 2019

**Figure 3.6-5 Electric Distribution, Power, Transmission Lines, and Substations in the Resource Study Area—San Jose Diridon Station Approach Subsection**

PG&E provides electricity to San Francisco. In addition to the electricity provided by PG&E, the San Francisco Public Utilities Commission (SFPUC) owns and operates the Hetch Hetchy Power System, which generates hydroelectric power. SFPUC also generates renewable energy from solar and biogas facilities. This renewable energy that is generated by the SFPUC powers all of the City's municipal facilities, including San Francisco International Airport (SFO), San Francisco General Hospital, San Francisco Municipal Railway (MUNI), fire stations, police stations, residences and businesses in the San Francisco Shipyard, Treasure Island, and other retail customers. This energy is delivered to its customers via PG&E's electrical transmission and distribution system. Overall, SFPUC provides about 17 percent of San Francisco's total electricity (SFPUC n.d.(a)).

The City of Palo Alto provides electricity to its customers within the city through their own infrastructure. The City of Palo Alto purchases electric power and currently provides its customers with a 100 percent carbon neutral electric supply. As of 2017, most of the power came from hydroelectric energy (59 percent), followed by solar energy (30 percent), landfill gas (11 percent), and wind (11 percent) (City of Palo Alto 2018a).

Silicon Valley Power (SVP) serves approximately 55,000 customers in the City of Santa Clara. SVP owns and operates seven generating plants and 30 substations, in addition to contracting for a share of numerous hydroelectric, wind, solar, and gas resources in California and neighboring states (SVP 2018). The electricity that SVP provides to its customers consists of renewable energy (biomass, geothermal, hydroelectric, solar, wind), coal, large hydroelectric, and natural gas. As of January 2018, SVP provides 100 percent carbon-free power to all residential customers (SVP 2018). Calpine operates electric generation equipment in San Jose (Calpine 2017).

Figures 3.6-1 through 3.6-5 also illustrate the locations of proposed traction power substations (TPSS) that are currently under construction by Caltrain to serve the blended system operations (as part of the proposed Caltrain Peninsula Corridor Electrification Project [PCEP]) from the 4th and King Street Station in San Francisco to Tamien Station in San Jose. The PCEP would install two TPSSs in South San Francisco and San Jose; seven paralleling stations in San Francisco (two facilities), Burlingame, San Mateo, Palo Alto, Sunnyvale, and San Jose; and one switching station in Redwood City. These facilities would be part of the baseline conditions for public utilities and energy.

Both alternatives would primarily rely on the electrical infrastructure proposed by PCEP. However, both alternatives would require a new electrical substation at the proposed Brisbane LMF. Figure 3.6-1 illustrates the locations of the new electrical substations. Furthermore, Alternative A would use the PCEP electrical infrastructure and would, therefore, not require the installation of new electrical infrastructure. While most of Alternative B (both viaduct options) would rely on the electrical infrastructure proposed by the PCEP, a new TPSS would need to be built for Alternative B (both viaduct options) in San Jose. Figure 3.6-5 illustrates location of this TPSS.

**High-Pressure Natural Gas Pipelines**

PG&E is the primary natural gas service provider for the region and is responsible for maintaining the infrastructure for natural gas distribution in all jurisdictions except Palo Alto. The Gas Operations Section at the City of Palo Alto Utility is responsible for maintaining and operating the city's gas distribution system, as well as overseeing its regulatory compliance.

Figure 3.6-6 illustrates natural gas pipelines in the public utilities RSA. Table 3.6-3 shows the number of major utility natural gas pipelines that cross or run parallel to the project alternatives. A total of 23 major utility high-pressure natural gas pipelines cross the alignment for Alternative A; a total of 22 major utility high-pressure natural gas pipelines cross the alignment for Alternative B (Viaduct to I-880); and a total of 21 major utility high-pressure natural gas pipelines cross the alignment for Alternative B (Viaduct to Scott Boulevard).


MAY 2019

**Figure 3.6-6 Natural Gas Pipelines in the Resource Study Area**

#### Petroleum and Fuel Pipelines

The SFPP Kinder Morgan Brisbane Terminal is a bulk petroleum storage and distribution terminal that provides aviation fuel to SFO as well as gasoline and diesel fuel to various retail stations on the peninsula. Gasoline, diesel, and aviation fuels are delivered to the facility through pipelines and are stored in 21 aboveground storage tanks. Aviation fuel is piped directly from the facility to SFO (Kinder Morgan n.d.).

Figure 3.6-7 illustrates major utility fuel pipelines within the public utilities RSA. Table 3.6-3 shows the number of major utility fuel pipelines that cross or run parallel to the project alternatives. The following petroleum and fuel pipelines are in the RSA:

- One major fuel line owned by Southern Pacific Pipeline crosses the alignment for Alternatives A and B in San Francisco.
- Eight major utility fuel pipelines owned by Kinder Morgan cross the alignment for Alternative A in Brisbane and six major utility fuel pipelines owned by Kinder Morgan cross the alignment for Alternative B in Brisbane.
- Two fuel pipelines cross the alignment in the San Jose Diridon Station Approach Subsection for Alternative A. The operator of these fuel pipelines could not be confirmed.

#### Communication Facilities

Communication networks, including MCI, Sprint, AT&T, Qwest, Brook Fiber, and Level 3 typically run underground fiber-optic cables parallel to the existing Caltrain right-of-way. Furthermore, Pacific Bell, AT&T, and local city providers provide telephone service aboveground using aerial fiber-optic cables that run parallel to and cross the existing Caltrain right-of-way. As shown in Table 3.6-3, Alternative A would cross 52 major communication lines, Alternative B (Viaduct to I-880) would cross 39 major communication lines, and Alternative B (Viaduct to Scott Boulevard) would cross 37 major communication lines.

#### Water Supply Infrastructure and Facilities

This section summarizes water suppliers and infrastructure by community from north to south within the RSA. The discussion is organized by type of water supplies, focusing on potable water and recycled water. This section also summarizes water demand within the public utilities RSA. Alternative A would cross or run parallel to 25 major water utilities, Alternative B (Viaduct to I-880) would cross or run parallel to 24 water utilities, and Alternative B (Viaduct to Scott Boulevard) would cross or run parallel to 23 water utilities. Appendix 3.6-A in Volume 2 includes detailed information on major utilities including water conveyance infrastructure that crosses or runs parallel to the project alternatives.

*Types of Water Supplies:*

- Potable water—Water that is safe to drink or for use in food preparation.
- Recycled water—Treated wastewater that can be used for landscape irrigation, industrial uses, etc.

#### *Potable Water*

The SFPUC provides water to the City and County of San Francisco, as well as all the other jurisdictions in the RSA (SFPUC 2016). The Hetch Hetchy Regional Water System (RWS) is owned by the SFPUC and supplies high-quality drinking water from the Tuolumne River watershed and from local reservoirs in the Alameda and Peninsula watersheds. The RWS draws an average of 85 percent of its supply from the Tuolumne River watershed, collected in Hetch Hetchy Reservoir in Yosemite National Park. This water feeds into an aqueduct system that delivers water 167 miles by gravity to San Francisco Bay Area (Bay Area) reservoirs and customers. The remaining 15 percent of the RWS supply is drawn from local surface waters in the Alameda and Peninsula watersheds. The split between these resources varies from year to year depending on the water year hydrology and operational circumstances. The SFPUC manages more than 280 miles of pipeline and 60 miles of tunnels, 11 reservoirs, 5 pump stations, and 2 water treatment plants (SFPUC 2016).


**Figure 3.6-7 Major Utility Fuel Pipelines in the Resource Study Area**

The SFPUC operates the water distribution system in San Francisco, which serves a population of nearly 850,000. Retail customers in the city are primarily served with RWS supply, but a few customers receive groundwater and recycled water. Similarly, suburban retail customers are primarily served with RWS supply, but a few customers receive groundwater. The distribution system in the city also includes 10 reservoirs and 8 water tanks that store water supplied by the RWS. Approximately 1,250 miles of pipelines and 17 pump stations move water throughout the system and deliver water to homes and businesses in the city (SFPUC 2016).

The SFPUC sells water to 26 wholesale customers. Wholesale customers obtaining water from the SFPUC belong to the Bay Area Water Supply and Conservation Agency. The business relationship between the SFPUC and its wholesale customers is largely defined by the 2009 Water Supply Agreement (SFPUC 2016). In terms of water supply, the Water Supply Agreement provides for 184 million gallons per day (mgd) on an annual average basis as the Individual Supply Guarantee to the SFPUC's wholesale customers, subject to certain reduction conditions stipulated in the contract (City and County of San Francisco 2009). In 2015, approximately 128 mgd of water (of the 184 mgd supply) were used by wholesale customers of the SFPUC (SFPUC 2016). The Cities of Brisbane, San Bruno, Millbrae, Burlingame, Redwood City, Menlo Park, Palo Alto, Mountain View, Sunnyvale, and Santa Clara are wholesale customers. The California Water Services Company is an investor-owned utility and provides water service distribution to South San Francisco, San Mateo, Belmont, San Carlos, and Atherton. The individual jurisdictions receiving the SFPUC water operate and maintain their own distribution systems and provide rate service to customers. Figure 3.6-8 illustrates the water distribution boundaries.

The SFPUC anticipates that the existing supplies described in this section will be available in the future. However, to reliably and sustainably meet the future water needs of its retail customers, the SFPUC is supplementing and diversifying its water supply portfolio through the development of local water supplies, such as by increasing groundwater, recycled water, and nonpotable water production (SFPUC 2016).

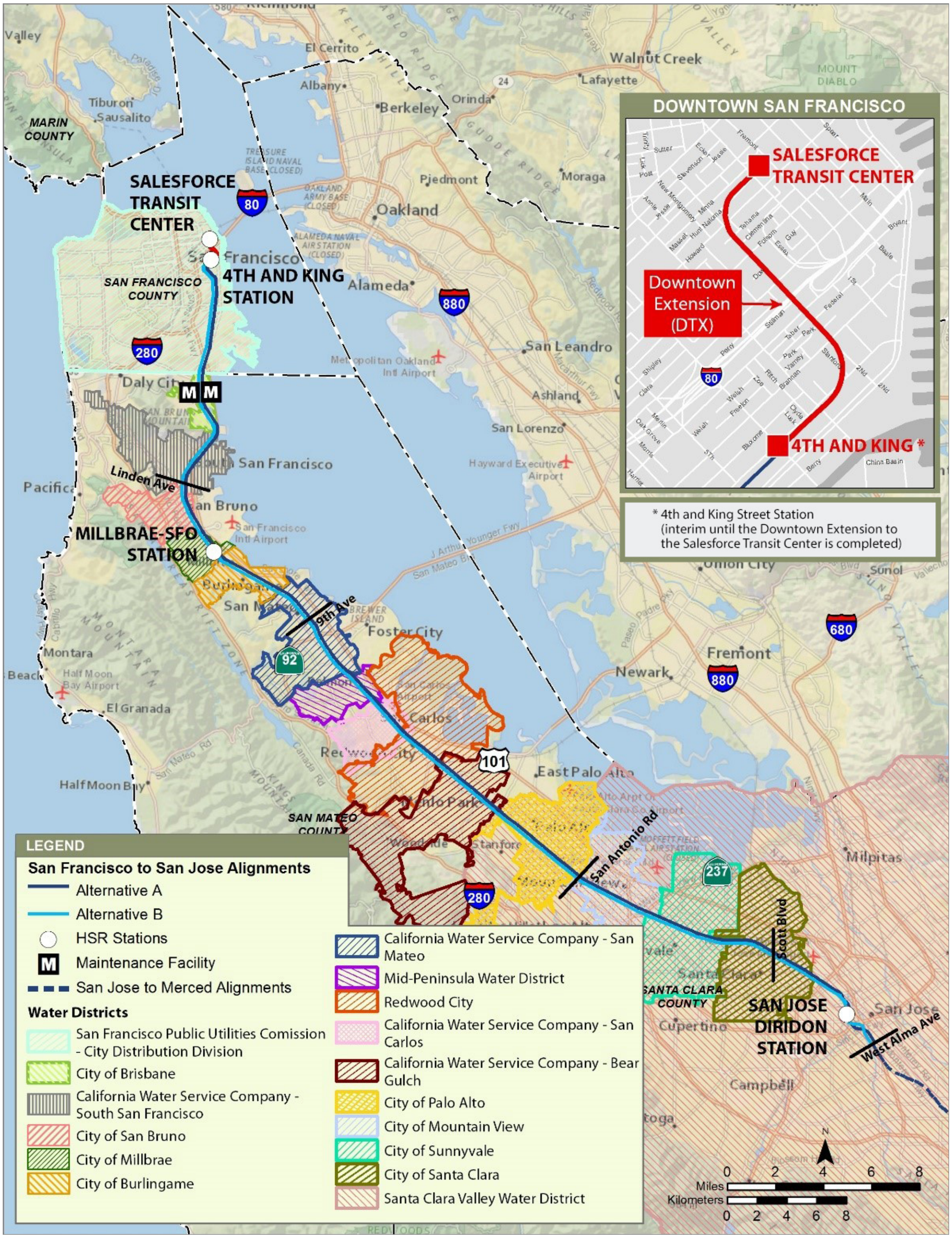
#### City of Santa Clara

The City of Santa Clara Water Utility supplies potable water to approximately 26,000 residents in Santa Clara. Water sources available to the City of Santa Clara Water Utility include a local underground aquifer, which provides about 62 percent of the City's potable water through 26 wells, and imported water supplies delivered by the Santa Clara Valley Water District (SCVWD) and the SFPUC (City of Santa Clara n.d.(a)).

#### City of San Jose

Three water suppliers provide potable water to the approximately 1 million residents of San Jose—the San Jose Water Company (SJWC), Great Oaks Water Company, and the San Jose Municipal Water System (SJMWS). These water suppliers are characterized as follows:

- **SJWC**—Primary source of potable water for the metropolitan area of San Jose. The SJWC sources potable water supplies from groundwater, local surface water, and imported treated surface water (City of San Jose 2016a). Typically, groundwater comprises approximately one third of SJWC's potable water supply, surface water from the local watersheds of the Santa Cruz Mountains comprises about 7 percent, and imported treated surface water originating from local reservoirs, the State Water Project, and the Central Valley Project comprise more than 50 percent of its potable water (City of San Jose 2016a). SJWC's distribution system has interties with City of Santa Clara, City of San Jose Municipal Water, City of Milpitas, and Great Oaks Water Company.
- **Great Oaks Water Company**—Provides potable water to approximately 20,000 residents in the San Jose neighborhoods of Blossom Valley, Santa Teresa, Edenvale, Coyote Valley-Almaden Valley. The Great Oaks Water Company sources their potable water from underground water supplies in the Santa Clara Valley Groundwater Basin (Great Oaks Water Company 2015, 2018).




Source: DWR 2018

MAY 2019

**Figure 3.6-8 Water Distribution System Boundaries**

- **SJMWS**—Provides potable water to approximately 113,650 residents in the San Jose neighborhoods of North San Jose/Alviso, Evergreen, Edenvale, and Coyote Valley. The SJMWS relies on four water sources: surface water from SFPUC, local and imported surface water from SCVWD, groundwater from the Santa Clara Subbasin, and recycled water from the South Bay Water Recycling (SBWR) system. The North San Jose/Alviso neighborhood's potable water supply is primarily surface water from SFPUC, most of which originates from the Hetch Hetchy Reservoir in the Sierra Nevada, and is supplemented by groundwater wells owned and operated by SJMWS (SFPUC 2016). In the neighborhoods of Evergreen, Edenvale, and Coyote Valley, groundwater from the Santa Clara Subbasin provides for most of the potable water use. The SJMWS also purchases treated surface water from SCVWD under a treated water contract.

### *Recycled Water*

Some, but not all, of the cities within the RSA generate recycled water at WWTPs. Some jurisdictions provide recycled water to customers via a recycled water distribution system and some jurisdictions use recycled water internally at the WWTPs. Recycled water is used mostly for irrigation and industrial processes. The use of recycled water, rather than potable water, is important for reducing the need for potable water supplies. A summary of the recycled water infrastructure is included in the following sections.

#### San Francisco Public Utilities Commission

There are two recycled water projects that are currently operated by the SFPUC. Since 2012, recycled water produced by the North San Mateo County Sanitation District, a subsidiary of Daly City, has been used to irrigate Harding Park and Fleming Golf Courses in San Francisco. Since 2014, recycled water from the North Coast County Water District has been used to irrigate the Sharp Park Golf Course in Pacifica, which is a retail water customer of the SFPUC (SFPUC n.d.(b)). In addition, the SFPUC is also currently working on two new recycled water projects, which would provide recycled water for irrigation to the eastern and western parts of the city (SFPUC 2016).

#### City of Millbrae

Millbrae's current recycled water use is limited to applications on-site at the City of Millbrae Water Pollution Control Plant. The City of Millbrae Water Pollution Control Plant produces restricted use disinfected secondary effluent. This effluent is used as recycled water and stored on-site in a 5,000-gallon storage tank. The recycled water is used to wash down and clean equipment, including the bar screens and clarifiers, and for dust control at the facility (City of Millbrae 2016).

#### City of Burlingame

The City of Burlingame uses approximately 300,000 gallons per day (gpd) of recycled water, for internal use within the City of Burlingame Wastewater Treatment Facility. The City of Burlingame does not currently anticipate expanding the generation and use of recycled water (City of Burlingame 2016).

#### City of Redwood City

The City of Redwood City operates and maintains a recycled water system. The recycled water systems include two tertiary treatment facilities, two 2.2-million-gallon storage tanks, a distribution pump station, and 17 miles of distribution pipelines. Pumping of recycled water began in 2007 and includes 450 points of connection. The City of Redwood City recently expanded its recycled water system to the downtown area and is proposing to further expand the system west of U.S. Highway (US) 101 (City of Redwood City n.d.).

#### City of Palo Alto

The City of Palo Alto recycled water pipeline distributes recycled water from the Palo Alto Regional Water Quality Control Plant to City of Palo Alto facilities, including the Municipal Golf Course, Municipal Services Center, Animal Services Facility, and Greer Park. Currently, the recycled water pipeline is not available for direct connections to Palo Alto residents or businesses. The City of Palo Alto is evaluating ways to offer this service in the future (City of Palo Alto 2018b).

#### City of Mountain View

The City of Mountain View uses tertiary treated recycled water from the Palo Alto Regional Water Quality Control Plant for irrigation in the North Bayshore area of the city. The City of Mountain View's recycled water distribution system includes 5.5 miles of recycled water mains, serving areas north of US 101 and west of State Route 237. There are currently 50 customer connections to the City's recycled water distribution system. The City is exploring opportunities to expand the recycled water system (City of Mountain View 2016).

#### City of Sunnyvale

Sunnyvale's current recycled water system consists of the City of Sunnyvale Water Pollution Control Plant pump station, the San Lucar tank and pump station, the Sunnyvale Golf Course pump station and approximately 18 miles of recycled water pipelines ranging in diameter from 6 to 36 inches. The system now supplies 124 services within the city limits as well as Moffett Field. Major customers include Baylands Park, Twin Creek Sports Complex, Lockheed Martin, and the Sunnyvale Municipal Golf Course (City of Sunnyvale 2016).

#### City of Santa Clara

SBWR has been serving the City of Santa Clara for more than 10 years. There are 33 miles of recycled water pipelines situated within Santa Clara's city limits with 267 active recycled water services. Current City of Santa Clara customers include Great America, Santa Clara University, Intel, and various city parks. The recycled water is used for irrigation of parks, schools, golf courses, cooling towers, and industrial processes (City of Santa Clara n.d.(b)).

#### City of San Jose

SBWR is a recycled water wholesaler to water retailers including the City of Santa Clara and two San Jose water suppliers (SJWC and SJMWS). The SBWR delivers approximately 6 billion gallons per year (approximately 11 mgd) of recycled water to more than 850 commercial customers (City of San Jose 2018). Recycled water from the SBWR makes up about 16 percent of the water sales of the City of Santa Clara Water Utility (City of Santa Clara n.d.(a)). The SBWR obtains recycled water from the San Jose-Santa Clara Regional Wastewater Facility (jointly owned by the Cities of Santa Clara and San Jose and operated by the City of San Jose's Environmental Services Department). This wastewater treatment facility treats and distributes to water to customers in San Jose, Santa Clara, and other jurisdictions in northern Santa Clara County for nonpotable agricultural and industrial uses (City of San Jose 2018). The Silicon Valley Advanced Water Purification Center (SVAWPC) adjacent to the regional wastewater facility further purifies the recycled water and blends it with tertiary treated water to produce high-quality recycled water. The SVAWPC is conducting a project to demonstrate the effectiveness of advanced treatment technologies to produce potable water for a potable water reuse program (SCVWD 2016).

### Wastewater Infrastructure

The project crosses a major urban area traversed by an extensive network of wastewater conveyance facilities operated by the individual jurisdictions. These facilities include wastewater pipelines and pump stations. Wastewater is conveyed to treatment plants operated either by the jurisdictions or by a wastewater treatment authority. Table 3.6-3 identifies the number of major wastewater conveyance facilities that cross or are parallel to the project alternatives. The various cities' public works departments generally manage the wastewater infrastructure. Table 3.6-4 summarizes the different wastewater treatment facilities that serve the jurisdictions that the project crosses, which are discussed in the following subsections by jurisdiction. The overall treatment processes at these wastewater treatment facilities consists of primary treatment (filtration of large particles), secondary treatment (removal of organic pollutants), and tertiary treatment (disinfection). The treated water is discharged into the San Francisco Bay. The cities that operate the wastewater treatment facilities are required to comply with NPDES permits that regulate discharge into the San Francisco Bay.

**Table 3.6-4 Wastewater Treatment Plant Capacity/Demand Summary for the Resource Study Area**

| Location | Operator | Wastewater Treatment Facility | Design/Operating Capacity – Dry Weather Flow (mgd) | Average Dry Weather Flow (mgd) | Remaining Daily Capacity (mgd)[1] |
|---|---|---|---|---|---|
| San Francisco<br>Brisbane | SFPUC | Southeast Water Quality Control Treatment Facility | 142.0 | 60.8 | 81.2 |
| | | Oceanside Water Pollution Control Plant | 43.0 | 16.1 | 26.9 |
| South San Francisco | Cities of South San Francisco and San Bruno | South San Francisco Water Quality Control Plant | 13.0 | 9.0 | 4.0 |
| San Bruno | | | | | |
| Millbrae | City of Millbrae | City of Millbrae Water Pollution Control Plant | 3.0 | 1.8 | 1.2 |
| Burlingame | City of Burlingame | City of Burlingame Wastewater Treatment Facility | 5.5 | 3.0 - 3.5 | 2.0 |
| San Mateo | City of San Mateo | City of San Mateo Wastewater Treatment Plant | 15.7 | 11.0 | 4.7 |
| Belmont | Silicon Valley Clean Water (Joint Power Authority governed by City of Redwood City, West Bay Sanitary District, City of San Carlos, and City of Belmont) | Silicon Valley Clean Water Wastewater Treatment Plant | 24.0 | 13.1 | 10.9 |
| San Carlos | | | | | |
| Redwood City | | | | | |
| Atherton | | | | | |
| Menlo Park | | | | | |
| Palo Alto | City of Palo Alto | Palo Alto Regional Water Quality Control Plant | 39.0 | 19.0 | 20 |
| Mountain View | | | | | |
| Sunnyvale | City of Sunnyvale | City of Sunnyvale Water Pollution Control Plant | 29.5 | 13.0 | 16.5 |
| Santa Clara[2]<br>San Jose[2] | City of San Jose Environmental Services Department | San Jose/Santa Clara Water Pollution Control Plant | 167.0 | 110.0 | 57 |
| | | **Total** | **481.7** | **257.3** | **224.4** |

*Sources: SFPUC 2010, 2016; California Water Service 2016; City of Millbrae 2016; City of Burlingame 2016; City of San Mateo 2017; City of Redwood City 2016; City of Palo Alto 2016; City of Sunnyvale 2016; City of San Jose 2018*
mgd = million gallons per day
[1] This number was calculated by identifying the difference between operating capacity and average dry weather flow.
[2] The City of Santa Clara and City of San Jose operate a joint treatment facility so combined figures are reported under Santa Clara

### City and County of San Francisco

The SFPUC Wastewater Enterprise operates and maintains the City of San Francisco's water pollution control plants, pumping stations, and collection system in full compliance with their discharge permits to protect public health and the environment. The Wastewater Enterprise maintains 1,900 miles of sewer mains and 27 pump stations that collect sewage and stormwater, moving the wastewater to the three treatment plants for treatment and discharge to the San Francisco Bay and Pacific Ocean (SFPUC n.d.(c)). During dry weather, wastewater is primarily conveyed to the Southeast Water Quality Control Treatment Facility. The Oceanside Water Pollution Control Plant is also used to treat wastewater. The capacity and average daily amount of wastewater that is treated at these plants is shown in Table 3.6-4. When it rains, the North Point Wet Weather Facility is utilized. This facility has the capacity to treat 150 mgd and it operates on average 30 times per year and treats an annual average wet-weather flow of 0.7 billion gallons (SFPUC 2010).

### City of South San Francisco and City of San Bruno

The Cities of South San Francisco and San Bruno own and operate the South San Francisco Water Quality Control Plant. Wastewater from the cities of South San Francisco and San Bruno are treated at the plant. The sewer system includes gravity lines and force mains that combine both wastewater and stormwater runoff (California Water Service 2016).

### City of Millbrae

The City of Millbrae is responsible for the collection, treatment, and disposal of wastewater within the City's service area boundary. The wastewater system consists of a dedicated sanitary sewer system, the City of Millbrae Water Pollution Control Plant, and a force main discharge outlet to San Francisco Bay. The wastewater collection system consists of approximately 55 miles of underground sanitary sewer pipe of various sizes. The sewer system is predominantly gravity drained; however, the system does have three sewage pumping stations (City of Millbrae 2016).

### City of Burlingame

The City of Burlingame operates and maintains a wastewater collection system that conveys wastewater from the users to the City of Burlingame Wastewater Treatment Facility. The system includes gravity pipelines, lift stations, and force mains. The effluent is sent to South San Francisco through the Burlingame-Millbrae Central Bay Outfall system and discharged after dechlorination into a joint-use deep-water outfall in the San Francisco Bay (City of Burlingame 2016).

### City of San Mateo

The City of San Mateo Department of Public Works Environmental Services Division provides stewardship of the City's sanitary sewer assets, including the City of San Mateo Wastewater Treatment Plant. The city operates and maintains 234 miles of collection system mainlines, 5,711 manholes, and 26 sewer lift stations. The sanitary sewer collection system is predominantly made of vitrified clay pipe and most of the system was built in the mid-1900s.

### City of Belmont, City of San Carlos, City of Redwood City, Town of Atherton, and City of Menlo Park

Wastewater from Belmont, San Carlos, Redwood City, Atherton, and Menlo Park is conveyed to the Silicon Valley Clean Water Wastewater Treatment Plant. The existing conveyance system includes four pump stations, a wet weather booster station in the San Carlos Pump Station, a lift station at the WWTP, and an approximately 9-mile-long, reinforced concrete force main (City of Redwood City 2016).

### City of Palo Alto and City of Mountain View

Wastewater that is generated in Palo Alto and Mountain View is treated at the Palo Alto Regional Water Quality Control Plant, which is operated by the City of Palo Alto. The Palo Alto Regional Water Quality Control Plant uses a multistep process to filter, clean, and disinfect wastewater so that it can safely be discharged to the San Francisco Bay or used for irrigation and other approved nonpotable uses (City of Mountain View 2016).

***City of Sunnyvale***

The City of Sunnyvale operates the City of Sunnyvale Water Pollution Control Plant. The plant collects wastewater from the sanitary sewer system, which consists of more than 380 miles of gravity-fed pipes that converge at the plant. Collected wastewater is subsequently treated to tertiary standards at the plant before it is discharged to the Lower South Bay sub-embayment of the San Francisco Bay (City of Sunnyvale 2016).

***City of Santa Clara***

The San Jose/Santa Clara Water Pollution Control Plant is owned by the Cities of San Jose and Santa Clara, and is managed and operated by the City of San Jose’s Environmental Services Department. This facility serves 1.4 million residents and over 17,000 businesses in 8 cities and 4 sanitation districts (City of San Jose 2018).

***City of San Jose***

The City of San Jose Environmental Services Department collects wastewater from residents and businesses throughout the city (City of San Jose 2014). The sewer system consists of approximately 2,294 miles of wastewater collection system pipeline that ranges from 6 to 90 inches in diameter, and approximately 45,000 manholes and 16 sewage lift stations that convey to the San Jose-Santa Clara Regional Wastewater Facility by major interceptor pipelines in the northern part of San Jose. In addition to the City’s collection system, wastewater is conveyed to the plant from several sewage collection systems operated by and serving Santa Clara and Milpitas, County Sanitation District 2-3, West Valley Sanitation District, Cupertino Sanitary District, and Burbank Sanitary District. Sewage generated within SJWC and SJMWS service areas is conveyed through the City of San Jose and West Valley Sanitation District collection systems and treated at the San Jose/Santa Clara Regional Wastewater Facility.

**Stormwater Management**

Storm drain systems are operated by each of the individual jurisdictions within the public utilities RSA. While the configuration of the system varies by jurisdiction, the networks typically consist of a series of pipes, detention/retention basins, pump stations, and culverts that discharge via channels, sloughs, or creeks into San Francisco Bay. The systems vary by age, size, and type depending on the municipality. The number of major storm drain facilities that cross or are parallel to the project are shown in Table 3.6-3.

***City and County of San Francisco***

Most of San Francisco is served by a combined storm sewer system, where stormwater, along with residential and commercial sewage, is directed to treatment plants prior to being released to the San Francisco Bay or Pacific Ocean. The City and County of San Francisco has developed a Stormwater Management Plan to manage stormwater. The Stormwater Management Plan describes specific programs that will be implemented to minimize stormwater pollution. The San Francisco Bay RWQCB (Region 2) approved the Stormwater Management Plan in January of 2004 (SFPUC n.d.(d)).

***San Mateo County***

The San Mateo Countywide Water Pollution Prevention Program (SMCWPPP) was established in 1990 to reduce the pollution carried by stormwater into local creeks, the San Francisco Bay, and the Pacific Ocean. The SMCWPPP is a partnership with the City/County Association of Governments of San Mateo County and 20 incorporated cities and towns in San Mateo County. These jurisdictions share a common NPDES permit, which includes requirements to prevent harmful pollutants from being dumped or washed by stormwater runoff into the stormwater system, then discharged into local waterbodies (SMCWPPP 2015).

### *Santa Clara County*

Santa Clara County's Clean Water Program oversees stormwater management through implementation of regional NPDES municipal stormwater permits (County of Santa Clara 2018a). The program is primarily responsible for the County's compliance with federal and state water quality requirements by promoting stormwater pollution prevention practices, erosion and sediment control, and landscape features that filter pollutants from stormwater runoff. The San Francisco Bay RWQCB (Region 2) regulates waters discharging to San Francisco Bay from the northern section of the county where the project would be located. Stormwater management systems in urban areas of Santa Clara County are operated and maintained by municipal public works departments. Stormwater management systems on public roads in unincorporated areas of Santa Clara County are maintained by the Santa Clara County Roads Administration. The County maintains 2,185 drain inlets (County of Santa Clara 2018b).

#### City of Santa Clara

The City of Santa Clara Public Works Department operates and maintains the storm sewer and stormwater management system in the City of Santa Clara (City of Santa Clara n.d.(a)). The stormwater management system includes 22 stormwater pump stations and an estimated 200 linear miles of pipe (8,452 links) and 8,452 nodes (including manholes, catch basins, pump stations, detention basins, and outfalls) (City of Santa Clara n.d.(a)).

#### City of San Jose

The City of San Jose's Department of Transportation operates and maintains the storm sewer system in San Jose. Construction of new portions of the storm drain system is the responsibility of the Department of Public Works. The City of San Jose's storm drainage system consists of more than 850 miles of storm drain lines, 27,900 catch basins and 30 stormwater pump stations (City of San Jose 2016b).

## Solid Waste Disposal

### *Solid Waste Disposal Facilities*

The following sections discuss solid waste facilities that may serve the project. Table 3.6-5 shows landfill locations, maximum permitted capacity, remaining capacity, and estimated closure date. There are a total of 16 landfills that serve the Bay Area and that could provide solid waste disposal or recycling during construction and operation of the project. These landfills are in Alameda, Contra Costa, Marin, Napa, San Mateo, and Santa Clara Counties. As shown in Table 3.6-5, the landfills that could serve the project have more than 290 million cubic yards of remaining landfill capacity and have anticipated closure dates between 2022 and 2118.

**Table 3.6-5 Solid Waste Volumes and Landfill Facility Summary**

| Landfill[1] | County | Landfill Permitted Daily Tonnage (tons per day) | Maximum Permitted Landfill Capacity (cubic yards) | Remaining Landfill Capacity (cubic yards) | Remaining Capacity as of Date | Estimated Permitted Closure Date |
|---|---|---|---|---|---|---|
| Altamont | Alameda | 11,150 | 124,400,000 | 65,400,000 | December 31, 2014 | 2025 |
| Vasco Road | Alameda | 2,518 | 32,970,000 | 7,379,000 | October 31, 2016 | 2022 |
| Acme | Contra Costa | 1,500 | 6,195,000 | 506,590 | March 1, 2012 | 2021 |
| Keller Canyon | Contra Costa | 3,500 | 75,018,280 | 63,408,410 | November 16, 2004 | 2030 |
| USS-Posco Industries Unit II | Contra Costa | 8 | 86,000 | Not available | Not available | 2118 |
| Redwood | Marin | 2,300 | 19,100,000 | 26,000,000 | December 18, 2008 | 2024 |
| Clover Flat Resource Recovery Park | Napa | 600 | 4,560,000 | 2,870,000 | September 1, 2012 | 2047 |
| Corinda Los Trancos Landfill (Ox Mountain Sanitary) | San Mateo | 3,598 | 60,500,000 | 22,180,000 | December 31, 2015 | 2034 |
| Newby Island Sanitary Landfill | Santa Clara | 4,000 | 57,500,000 | 21,200,000 | October 31, 2014 | 2041 |
| Kirby Canyon Recycling and Disposal Facility | Santa Clara | 2,600 | 36,400,000 | 16,191,600 | July 31, 2015 | 2022 |
| Guadalupe Community Facility | Santa Clara | 1,300 | 28,600,000 | 11,055,000 | January 1, 2011 | 2048 |
| Recology Hay Road[2] | Solano | 2,400 | 37,000,000 | 30,433,000 | July 28, 2010 | 2077 |
| Potrero Hills | Solano | 4,330 | 83,100,000 | 13,872,000 | January 1, 2006 | 2048 |
| Central Disposal Site | Sonoma | 2,500 | 32,650,000 | 9,076,760 | May 15, 2012 | 2034 |
| | **Total** | **42.304** | **598,079,280** | **289,572,360** | **N/A** | **N/A** |

*Sources: CalRecycle 2018b*
C&D = construction and demolition
[1] All landfills are permitted to accept C&D wastes. The Zanker Road facility in the City of San Jose is a licensed recycling facility that is permitted to accept C&D debris wastes for recycling; the Zanker Road facility is not permitted as a solid waste disposal facility and does not have any solid waste disposal capacity (CalRecycle 2014a). The facility could be used for recycling of C&D debris generated by project construction.
[2] Recology Hay Road Landfill, which collects and processes residential, commercial, and municipal waste produced in San Francisco and a portion of Brisbane is proposing to modernize its existing facilities to help meet the San Francisco 2020 goal of zero waste (City of Brisbane n.d.).

### *Solid Waste Volumes*

Table 3.6-6 shows waste disposal characteristics of communities in San Francisco, San Mateo, and Santa Clara Counties. A total of approximately 1.5 million tons of solid waste is generated from San Francisco, San Mateo, and Santa Clara Counties, with the largest amount (627,000 tons) from the City and County of San Francisco. Annual per capita disposal rates per resident range from 4.0 pounds per day (PPD) for unincorporated areas of Santa Clara County to 16.9 PPD for the City of Brisbane. Annual per capita disposal rates per employee range from 2.3 PPD for the City of Palo Alto to 19.3 PPD for the Town of Atherton.

**Table 3.6-6 Solid Waste Disposal Volumes and Diversion Summary**

| Jurisdiction | Amount of Solid Waste Landfilled in 2017 (tons) | Annual Per Capita Disposal Rate (PPD) Per Resident | | Annual Per Capita Disposal Rate (PPD) Per Employee | |
|---|---|---|---|---|---|
| | | Actual | Target | Actual | Target |
| City and County of San Francisco | 627,000 | 6.6 | 3.7 | 10.6 | 4.6 |
| Unincorporated County of San Mateo | 42,000 | 5.1 | 3.1 | 15.7 | 7.1 |
| City of Brisbane | 6,000 | 16.9 | 7.2 | 7.9 | 5.8 |
| City of South San Francisco | 89,100 | 6.9 | 7.3 | 9.0 | 9.5 |
| City of San Bruno | 36,500 | 4.5 | 3.7 | 15.9 | 10.3 |
| City of Millbrae | 12,600 | 5.3 | 2.8 | 22.8 | 12.5 |
| City of Burlingame | 35,600 | 8.3 | 7.1 | 6.6 | 5.1 |
| City of San Mateo | 80,700 | 5.8 | 4.2 | 13.3 | 7.4 |
| City of Belmont | 14,200 | 5.3 | 3.0 | 20.2 | 12.0 |
| City of San Carlos | 33,800 | 7.5 | 7.6 | 14.4 | 13.4 |
| City of Redwood City | 73,400 | 9.1 | 4.2 | 14.4 | 5.9 |
| Town of Atherton | 7,100 | 11.4 | 5.3 | 48.9 | 19.3 |
| City of Menlo Park | 32,600 | 7.5 | 5.1 | 9.2 | 4.5 |
| Unincorporated County of Santa Clara | 104,100 | 4.0 | 4.4 | 13.1 | 12.1 |
| City of Palo Alto | 47,700 | 8.2 | 3.5 | 7.1 | 2.3 |
| City of Mountain View | 50,400 | 7.8 | 3.5 | 10.9 | 3.1 |
| City of Sunnyvale | 92,400 | 5.0 | 3.6 | 8.3 | 6.1 |
| City of Santa Clara | 155,000 | 8.2 | 7.5 | 9.0 | 7.9 |
| City of San Jose | 716,700 | 3.3 | 5.2 | 8.5 | 14.5 |
| **Total** | **2,256,900** | | | | |

*Sources: CalRecycle 2017, 2018a*
PPD = pounds per day

The City and County of San Francisco Department of the Environment (SFE) is responsible for the City's role in recycling and waste-reduction programs throughout San Francisco. The SFE is working to meet the City goals of zero waste by 2020 (SFE 2006).[2] Various policies have been adopted to meet the zero waste goal, including the Mandatory Recycling and Composting Ordinance, which requires residents and businesses to properly sort recyclables from compostables and keep them out of the trash to landfill, and the Construction and Demolition Debris Recovery Ordinance, which requires the diversion of C&D debris from landfills (SFE 2019). As described in Section 3.6.3, Consistency with Plans and Laws, overall the project would be consistent with the local goals, policies, and objectives related to the City's recycling and waste-reduction goals.

**Hazardous Waste Disposal Facilities**

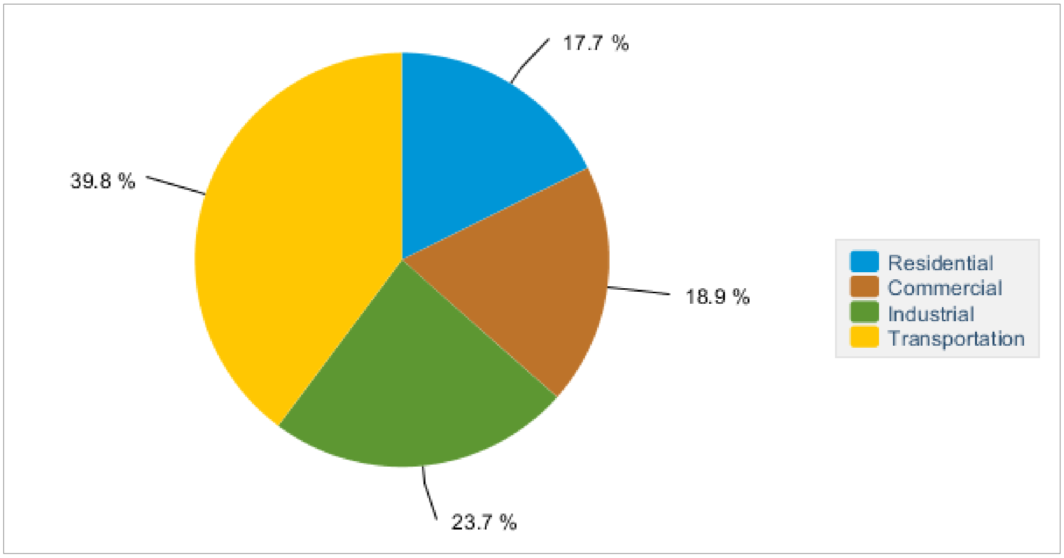
There are three RCRA-permitted hazardous waste landfills in California—the Kettleman Hills Facility in Kings County; the Clean Harbors Facility in Buttonwillow in Kern County; and the Clean Harbors Facility in Westmorland in Imperial County (California Department of Toxic Substances Control [DTSC] n.d.). The Kettleman Hills facility is approximately 150 miles south of the project footprint, the Clean Harbors Buttonwood Facility is approximately 200 miles south of the project footprint, and the Clean Harbors Westmorland Facility is approximately 500 miles south of the project footprint. The Kettleman Hills hazardous waste disposal facility in Kings County has a remaining disposal capacity of approximately 4.9 million cubic yards based on DTSC approval of a permitted expansion in 2014 (DTSC 2018). The Kettleman Hills facility is planning the development of a new hazardous waste landfill (Unit B-20) on currently undeveloped land at the Kettleman Hills site, to open after current unit (B-18) reaches capacity, and the facility is planning to operate until 2042 (Kings County Planning Agency 2008). The Clean Harbors Buttonwillow Facility has a permitted hazardous waste disposal capacity of 13.25 million cubic yards and an estimated closure date of 2040 (CalRecycle 2014b). Clean Harbors reported a permitted disposal capacity in excess of 10 million cubic yards for the Buttonwillow landfill (Clean Harbors n.d.(a)).

### *3.6.5.2 Energy*

California's total energy consumption in 2016 was estimated to be 7,830 trillion Btus (EIA 2018b). The transportation sector in 2016 accounted for 39.8 percent of California's energy use, the industrial sector 23.7 percent, the commercial sector 18.9 percent, and the residential sector 17.7 percent (EIA 2016a). Figure 3.6-9 illustrates California's energy consumption by sector in 2016 and Figure 3.6-10 illustrates the California energy consumption estimates by type in 2016.

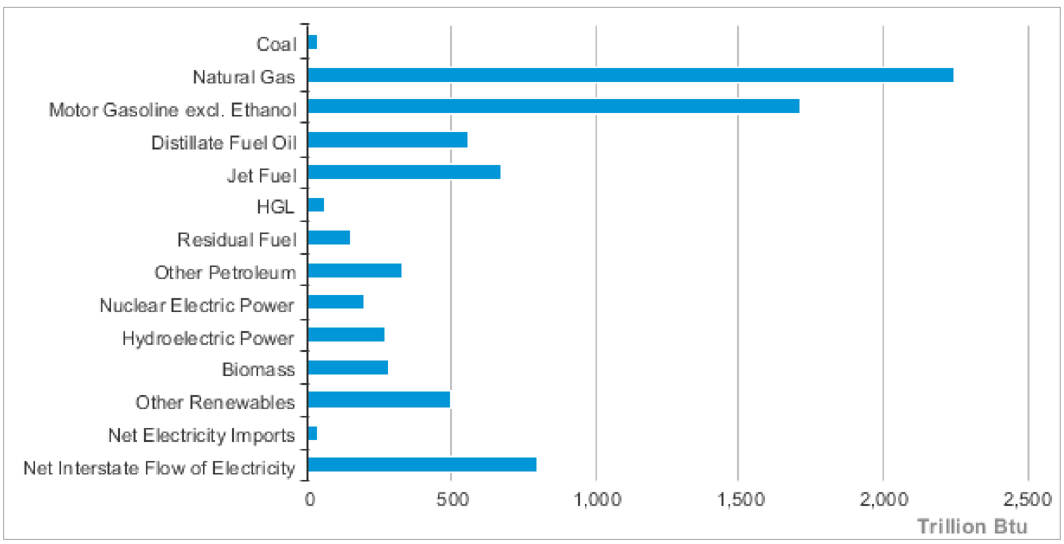
Petroleum products, including motor gasoline, distillate fuel oil, jet fuel, liquefied petroleum gas, residual fuel oil, and other petroleum, were the largest source of energy consumed in 2016 in California at 44.4 percent of the total in 2016, corresponding to 3,476 trillion Btus. The second largest source of energy consumed in California was natural gas, at 28.7 percent of the total in 2016, corresponding to 2,248 trillion Btus. Coal represented 0.4 percent of California's total energy consumption in 2016, corresponding to 32 trillion Btus (EIA 2018b). For energy consumption sources for the transportation sector in California in 2016, petroleum is by far the largest source at 97.7 percent, representing 3,065 trillion Btus (EIA 2018c). Ethanol is the second largest source of energy for transportation in California, at 4.0 percent, representing 126 trillion Btus, followed by natural gas (1.4 percent, representing 43 trillion Btus) and electricity (0.1 percent, representing 2.7 trillion Btus) (EIA 2016b, 2018b).

[2] *Zero waste* means products are designed and used according to the waste-reduction hierarchy (i.e., prevent waste, reduce and reuse first, then recycle and compost) and the principle of highest and best use, so no material goes to landfill or high-temperature destruction (SFE 2019).




*Source: EIA 2016a*

**Figure 3.6-9 California Energy Consumption by Sector, 2016**




*Source: EIA 2016c*

**Figure 3.6-10 California Energy Consumption Estimates by Type, 2016**

## Electricity

### *Demand*

There are two ways to measure electricity demand—consumption and peak demand. Electricity consumption is the total amount of electricity used over a period of time. According to the CEC, total statewide electricity consumption grew from 219,362 million kilowatt hours in 1990 to 285,700 million kilowatt hours in 2016 (CEC 2018a). Table 3.6-7 shows electricity consumption in San Francisco, San Mateo, and Santa Clara Counties in 2015. Santa Clara County consumed the most electricity (62.4 percent of the region's 26,876 million kilowatt hours), followed by San Francisco County (21.4 percent), and San Mateo County (16.1 percent).

**Table 3.6-7 Electricity Consumption in San Francisco, San Mateo, and Santa Clara Counties, 2015**

| County | 2015 Usage (millions of kilowatt hours/year) | 2015 Usage (MMBtu/year) |
|---|---|---|
| San Francisco | 5,759 | 19,651,000 |
| San Mateo | 4,340 | 14,809,000 |
| Santa Clara | 16,777 | 57,245,000 |
| **Total regional consumption** | **26,876** | **91,705,000** |
| **Total statewide consumption** | **283,000** | **965,636,000** |

*Source: CEC 2018a*
MMBtu = million British thermal units
Numbers are rounded.

The highest electric power requirement during a specified period, known as peak demand, is measured as the amount of electricity consumed at any given moment, usually integrated over a 1-hour period. Because electricity must be generated at the instant it is consumed, this measurement specifies the greatest generating capacity that must be available during periods of peak demand. Peak demand is important in evaluating system reliability, identifying congestion points on the electrical grid, and designing required system upgrades. California's peak demand typically occurs in August, between 3 p.m. and 5 p.m. (California Independent System Operator [Cal-ISO] 2017). In the energy RSA, high air conditioning loads contribute to the summer peak demand.

### *Generation*

The projected net power supply[3] within the grid controlled by the Cal-ISO for summer 2015 was 65,288 megawatts (MW) (Cal-ISO 2015). Table 3.6-8 shows fuel sources for electric power in California for 2015. California annual in-state electric power generation was 206,336 gigawatt hours (GWh) in 2017 (CEC 2017a).

### *Electricity Market Outlook*

Statewide, the average summer net power supply in 2015 was estimated at 65,288 MW and existing spring 2015 generation capacity was estimated at 54,044 MW for Cal-ISO (Cal-ISO 2015). Assuming 1-in-2 summer temperatures,[4] summer peak electricity demand was estimated at approximately 47,188 MW in 2015. The result is a predicted planning reserve margin[5] of 36 percent (Cal-ISO 2015). The Cal-ISO 2018 1-in-2 peak demand forecast is 46,625 MW, which is 0.09 percent below the 2017 weather normalized peak demand of 46,669 MW (Cal-ISO 2018a). California's population was 39.8 million as of January 1, 2018 (California Department of Finance [CDOF] 2018a), and is projected to exceed 42 million by 2025 and 47 million by 2040, requiring an additional 86,000 MW of peak summer capacity between 2017 and 2040[6] to meet the projected year 2040 demand and have an adequate reserve margin (Cal-ISO 2015).

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[3] The *projected net power supply* is defined as the maximum generating capacity of a unit during typical seasonal peak conditions, minus the unit's capability used for station service or auxiliaries (Cal-ISO 2015).

[4] 1-in-2 forecast temperatures are temperatures with a 50 percent chance of not being exceeded.

[5] Planning reserve calculation = ((Total Net Supply + Demand Response + Interruptible Power)/1-in-2 Demand) – 1.

[6] This value assumes a 1.5 percent annual growth rate in peak demand and includes a 15 percent reserve margin.

**Table 3.6-8 Fuel Sources for Electric Power in California in 2017[1]**

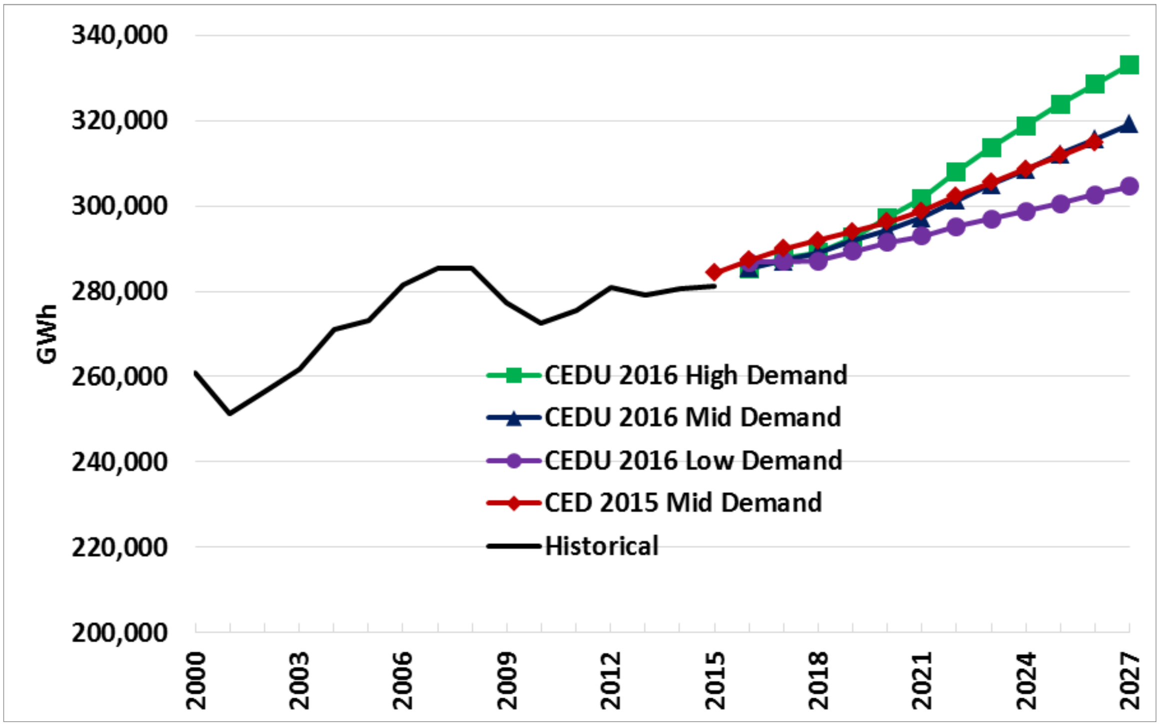
| Fuel Type | California In-State Generation (GWh) | Percent of California In-State Generation |
|---|---|---|
| Coal | 302 | 0.2 |
| Large hydro | 36,920 | 17.9 |
| Natural gas | 89,564 | 43.4 |
| Nuclear | 17,925 | 8.7 |
| Oil | 33 | 0.0 |
| Other | 409 | 0.2 |
| Biomass | 5,827 | 2.8 |
| Geothermal | 11,745 | 5.7 |
| Small hydro[2] | 6,413 | 3.1 |
| Solar | 24,331 | 11.8 |
| Wind | 12,867 | 6.2 |
| **Total Electric Industry** | **206,336** | **100** |

*Source: CEC 2017a*
GWh = gigawatt hours
MW = megawatt
N/A = not applicable
[1] Data as of July 11, 2016 from Quarterly Fuel and Energy Reports and Senate Bill 1305 Reporting Requirements. In-state generation is reported generation from units 1 MW and larger.
[2] Hydroelectric facilities smaller than 30 MW of generation capacity are considered "small" hydro and are part of the Renewables Portfolio Standard.

The CEC *California Energy Demand (CED) 2017–2027, Preliminary Electricity Forecast* (CEC 2017b) describes the CEC's preliminary 10-year forecasts for electricity consumption, retail sales, and peak demand for each of five major electricity planning areas and for the state as a whole. The CED document considers three baseline cases (low, mid, and high) designed to capture a reasonable range of demand outcomes for years 2017–2027. The three cases are summarized as follows:

- Low demand—The low energy demand case incorporates lower economic/demographic growth, higher assumed rates, and higher self-generation impacts.
- Mid demand—The mid energy demand case uses input assumptions at levels between the high demand and low demand cases.
- High demand—The high energy demand case incorporates relatively high economic/demographic growth and climate change impacts, and relatively low electricity rates and self-generation impacts.

Figure 3.6-11 illustrates projected base demand electricity consumption for the three CED 2016 baseline cases. California electricity consumption in 2015 was approximately 280,000 GWh. Electricity consumption in 2027 is projected to be approximately 320,000 GWh for the mid demand case. Average annual projected base energy demand growth rates from 2015 to 2027 for the CED 2016 forecast averages are 1.4 percent, 1.1 percent, and 0.7 percent in the high energy demand, mid energy demand, and low energy demand cases, respectively, compared to a 0.93-percent projected energy demand growth rate in the CED 2015 mid demand case (CEC 2017b). The increasing demand for electrical energy is based on growth in both population (i.e., households) and commerce (i.e., commercial and industrial businesses). Weather can also influence electricity demand.




*Source: CEC 2017b*
CED = California Energy Demand (2015)
CEDU = California Energy Demand—Updated Forecast (2016)

**Figure 3.6-11 Historical Trends and Projected Statewide Annual Electricity Consumption Base Demand**

*Source: CEC 2017b*
CED = California Energy Demand (2015)
CEDU = California Energy Demand—Updated Forecast (2016)

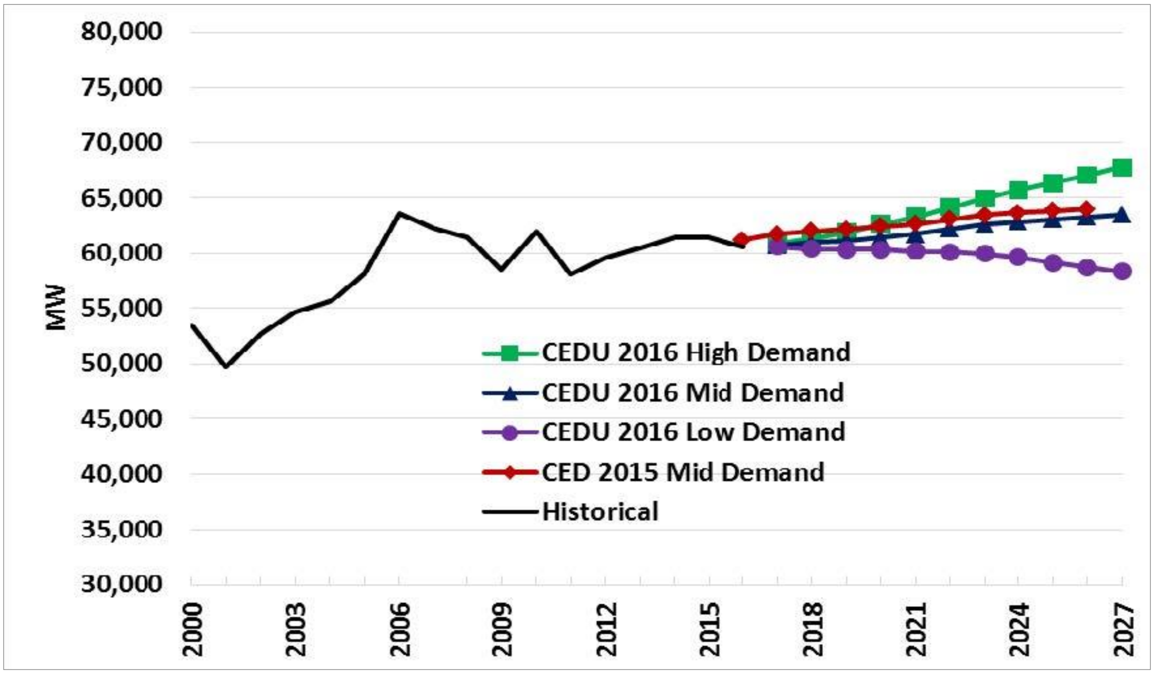
Figure 3.6-12 illustrates projected peak electricity demand for the three CED 2016 baseline cases. California electricity peak demand in 2015 was approximately 60,000 MW. Peak electricity demand in 2027 is projected to be approximately 64,000 MW for the mid demand case. Annual projected statewide growth rates in peak demand from 2016 to 2027 for the CEDU 2016 cases shown in Figure 3.6-12 average 1.03 percent, 0.44 percent, and -0.30 percent in the high, mid, and low cases, respectively, compared to a 0.45 percent projected energy demand growth rate in the CED 2015 mid demand case (CEC 2017b).

### *Transmission*

Cal-ISO operates approximately 26,000 miles of high-voltage electric transmission lines, which connect the different regions of the state to each other, to varying degrees, as well as to the transmission systems of the surrounding western states, Canada, and Mexico (Cal-ISO 2018b). The system links generation to distribution in a complex electrical network that balances supply and demand on a nearly instantaneous basis. The degree to which areas are interconnected depends upon the availability of transmission capacity between the areas. These interconnected electric transmission systems allow power purchases and sales to extend beyond state and national borders. Cal-ISO, a nonprofit entity responsible for the

> *High-Voltage Electric Transmission Lines*
>
> The electrical power industry defines high-voltage electric transmission lines as those that are more than 100 kilovolts.

system's reliability and nondiscriminatory transmission of energy, operates California's transmission system (Cal-ISO 2018b).




*Source: CEC 2017b*
CED = California Energy Demand (2015)
CEDU = California Energy Demand—Updated Forecast (2016)

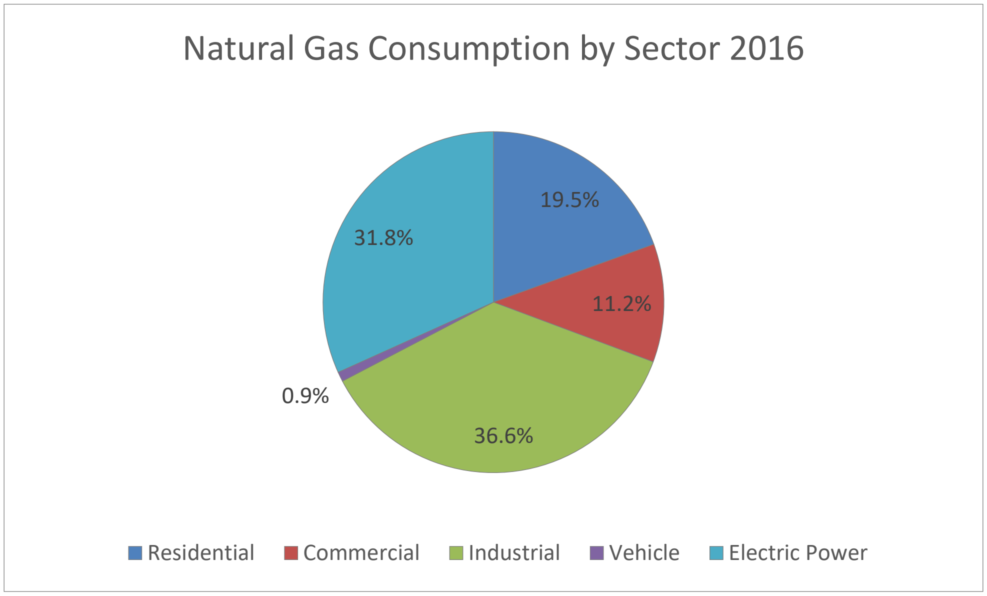
**Figure 3.6-12 Historical Trends and Projected Statewide Annual Electricity Consumption—Peak Demand**

Long-term electric transmission planning identifies transmission upgrades needed to serve future loads, as well as to compensate for changes in generation patterns, such as the renewable power generation being introduced into the grid to meet RPS pursuant to state law (SB 350), requiring that 50 percent of retail sales of all utilities in the state come from renewable resources by the end of 2030.

### Natural Gas

#### *Demand and Consumption*

California is the second largest consumer of natural gas in the nation, with consumption of million cubic feet (MMcf) per year in 2016 (EIA 2018b, 2018d). Natural gas is the most used fuel for electricity generation in California (see Table 3.6-8), and approximately 32 percent of this total daily consumption in 2016 was for electricity generation. Figure 3.6-13 illustrates the natural gas demand in California by sector for 2016. Table 3.6-9 shows natural gas consumption in San Francisco, San Mateo, and Santa Clara Counties in 2016 (CEC 2018b). The three counties used 76,800 MMcf of natural gas in 2016. Of that amount, 29.6 percent was consumed in San Francisco County, 15.6 percent in San Mateo County, and 54.8 percent was consumed in Santa Clara County.




*Source: EIA 2018d*

**Figure 3.6-13 California Natural Gas Demand by Sector, 2016**

**Table 3.6-9 Natural Gas Consumption in San Francisco, San Mateo, and Santa Clara Counties in 2016**

| County | 2016 Usage (millions of cubic feet) |
|---|---|
| San Francisco County | 22,700 |
| San Mateo County | 12,000 |
| Santa Clara County | 42,100 |
| **Total** | **76,800** |

*Source: CEC 2018b*
Numbers are rounded.

The CEC expects natural gas consumption in California to increase by 0.75 percent annually between 2016 and 2028 for the high demand forecast case and to increase by 0.55 percent annually for the mid demand forecast case (CEC 2018c, 2018d). Projected natural gas consumption in 2028 is 1,395,200 MMcf for the high demand case and 1,361,300 MMcf for the mid demand case, which would be an increase from the 2016 natural gas consumption of 1,275,100 MMcf (CEC 2018c, 2018d). After implementation of the California RPS and full penetration of energy efficiency, the CEC expects overall natural gas demand from population growth to reach 5.9 billion cubic feet (Bcf) per day by 2030 in the mid demand case, which would remain below the total 2015 natural gas consumption rate (CEC 2015b). The CEC (2015) estimates for the mid demand case that the total natural gas consumption would decrease from 6,334 MMcf/day in 2015 to 5,920 MMcf/day in 2030 as a result of the application of energy efficiency measures.

***Production***

Natural gas marketed production in California in 2016 was 205,024 MMcf (EIA 2018e), accounting for 9.7 percent of 2016 in-state consumption of 2,113,847 MMcf (EIA 2018d); out-of-state supply of natural gas to California in 2016 included Arizona (805,528 MMcf), Nevada (510,817 MMcf), and Oregon (680,979 MMcf) (EIA 2018f).

### *Updated Natural Gas Market Outlook*

Although California's natural gas market is affected by nationwide price conditions, the state has taken steps to insulate itself from the full magnitude of the price-swing amplitudes. Since the height of the 2000–2001 energy crisis, California has built 2.2 Bcf of daily capacity to deliver natural gas supplies from Canada, the Rocky Mountains, and the Southwest, in addition to adding almost 1 Bcf of daily intrastate pipeline capacity. The State of California has also invested in underground storage capacity, an effective mechanism for controlling annual costs that will allow them to dampen the effect of future severe price increases by drawing on stored gas instead of buying high-priced natural gas on the open market.

## Petroleum

### *Production*

California produced 174 million barrels of crude oil in 2017 (EIA 2018g) and had proven crude oil reserves (including in-state offshore reserves) of 1,933 million barrels as of December 2016 (EIA 2018h). In 2017, approximately 617 million barrels (1.69 million barrels per day) of petroleum were processed into a variety of products, with gasoline representing approximately 66 percent of the total product volume (CEC 2017c); approximately 18 percent of petroleum product production from California's refineries was aviation fuel; 22 percent was distillate fuel oil; and 2 percent was residual fuel oil (CEC 2017c).

### *Imports*

California imported approximately 354 million barrels of crude oil from foreign countries in 2017 and obtained approximately 77 million barrels of crude oil from Alaska (CEC 2017d). The CEC reported in-state crude oil production and domestic crude oil imports of approximately 194 million barrels for 2017; this value includes both crude oil produced in California and crude oil transported to California from the other lower 48 states including North Dakota and Gulf Coast states (CEC 2017d). Overall petroleum supply in 2017 in California was therefore approximately 625 million barrels of crude oil (CEC 2017d).

### *Demand*

Almost 40 percent of California's energy consumption results from the transport of goods and people (see Figure 3.6-9). In 2017, sales of diesel fuel to California end users were approximately 1,214,300 gpd and sales of gasoline to California end users was approximately 4,369,600 gpd (approximately 1.6 billion gallons per year) (EIA 2018i, 2018j). The population in California is projected to exceed 47 million people by 2040 (CDOF 2018b). Because of trends in travel demand, congestion, and other travel conditions, the market for intercity travel in California that the proposed HSR system could serve is projected to grow by up to 46 percent from 2010 to 2040 (CDOF 2013).

Automobile travel is the predominant mode of passenger transportation within the energy RSA. Historically, demand for transportation services (and petroleum consumption) in California has mirrored the growth of the state's population and economic output. The recent trend toward electric vehicles has generated renewed interest in more fuel-efficient cars and in living closer to the workplace. Although it is a slow process to transform an automobile fleet, drivers are increasingly making automobile purchasing decisions based on fuel consumption concerns. Automobiles powered by diesel engines and hybrid engines composed of both electrical and gasoline components offer substantial fuel-efficiency upgrades over traditional gasoline engines.

Rail and transit systems in the RSA include the Bay Area Rapid Transit District (BART), Santa Clara Valley Transportation Authority (VTA), MUNI, San Mateo County Transit District (SamTrans), Caltrain, Amtrak, and Altamont Corridor Express (ACE). The BART and VTA systems are electric rail systems. The VTA provides light rail passenger rail service in Santa Clara County from Mountain View to Almaden and Santa Teresa including San Jose Diridon Station (VTA 2018). BART provides passenger rail transit service to downtown San Francisco to and from cities in the northern portion of the San Francisco Peninsula, Oakland, and other cities in the East Bay. BART and VTA are in the process of implementing an extension to Santa Clara that will include new BART stations in downtown San Jose, Diridon Station, and Santa Clara. MUNI provides a network of buses, light-rail trains, streetcars, and cable cars that serve the City of San Francisco (San Francisco Municipal Transportation Agency 2018). MUNI service connects neighborhoods in San Francisco with BART and Caltrain. SamTrans provides bus service throughout San Mateo County and into parts of San Francisco and Palo Alto (SamTrans 2018). Caltrain provides passenger rail service from San Francisco to Gilroy through San Jose Diridon Station and Morgan Hill (Caltrain 2018). Amtrak Capitol Corridor and Coast Starlight routes provide passenger rail service to San Jose Diridon Station (Amtrak 2018). ACE provides passenger rail service between Stockton and San Jose and Santa Clara (ACE 2018). The Caltrain, Amtrak, and ACE systems are diesel locomotive systems. Caltrain reported consumption of approximately 4.5 million gallons of diesel fuel in 2016 (FRA 2016).

## 3.6.6 Environmental Consequences

### *3.6.6.1 Overview*

This section discusses the potential impacts on public utilities and energy that could result from construction and operation of the project alternatives. It is organized according to topic: public utilities, including electricity, natural gas, and petroleum fuels, water, wastewater, stormwater, and solid waste disposal; and energy resources, including electricity, natural gas, and petroleum fuels. Each topic area discusses potential impacts from the No Project Alternative and the project alternatives.

The project would have the potential to affect utilities during construction and operation of the project. During construction, standard procedures would be implemented, including identification of all existing utilities within the construction footprint and notification of the public, which would minimize conflicts and interruptions to service. Utilities within the project footprint would be protected in place or relocated, such that utility service would be maintained. Overall, the project would not substantially interrupt utility service during construction. During construction, the use of utilities, including water, wastewater facilities, stormwater facilities, and solid waste facilities, would be temporary and would cease after construction has been completed. There is sufficient capacity of these utilities to serve the project during construction. Operation of stations and the LMF would result in an increase in demand on water, wastewater, stormwater, and solid waste facilities; however, these utilities have enough capacity to serve the project during operations.

Overall, once constructed and operating passenger service the HSR system would result in a net decrease in energy consumption for other modes of transportation including operation of motor vehicles and aircraft as a result of reduction in VMT and airplane flights. Reduced transportation energy use would occur upon the start of passenger service and build over time to the 2040 horizon year for analysis. Further, the project would be constructed and operated in an energy-efficient manner. For example, the stations would qualify for Leadership in Energy and Environmental Design (LEED) certification, and the Authority has committed to powering the system on 100 percent renewable energy. To achieve this, the design would incorporate the means to produce or procure enough renewable energy to offset the amount of power used to operate the trains and facilities taken from the state's power grid.

California has an abundance of renewable energy resources that have the capacity to substantially meet the state's RPS as well as the minimal demand of the HSR system. The RPS-approved renewable sources include biomass, small hydro, geothermal, solar, and wind. Those not included are ocean thermal, wave, and tidal action. Initial findings from the Authority's call to industry are that a variety of companies have the capacity to supply the entire electricity needs of the system at full volume and are prepared and interested in delivering that capacity. The next step would be to determine the final loads for initial operational segments, as well as the expected start date for testing and commissioning of systems. After that, the Authority would issue a request for proposals to meet its renewable energy demands.

### 3.6.6.2 Public Utilities

Construction of the project would result in temporary and permanent impacts on public utilities, including the temporary and permanent relocations of public utilities and reduction of access by public utility operators to public utilities remaining in the HSR right-of-way after construction is completed. Construction of the project would also result in planned and unplanned temporary interruptions of utility services to public utility customers. Operation of the project would result in permanent impacts on public utilities such as the ongoing use of water for operation of the stations and Brisbane LMF, generation of wastewater and stormwater from operations, and generation of solid waste and hazardous waste from operations.

**No Project Impacts**

The population in San Francisco, San Mateo, and Santa Clara Counties is expected to grow through 2040 (see Section 2.6.1.1, Projections Used in Planning). Development to accommodate the population increase under the No Project Alternative would result in direct and indirect impacts on public utilities. The No Project Alternative considers the effects of conditions forecasted by current land use and transportation plans in the vicinity of the project, including planned improvements to the highway, aviation, conventional passenger rail, freight rail, and port systems through the 2040 planning horizon. Without the HSR project, the forecasted population growth would increase pressure to expand highway and airport capacities. The Authority estimates that additional highway and airport projects (up to 4,300 highway lane miles and 115 airport gates) would be needed to achieve equivalent capacity and relieve the increased pressure (Authority 2012). Section 3.18, Cumulative Impacts, identifies planned and other reasonably foreseeable future projects anticipated to be constructed in the region to accommodate the projected growth in the area, including shopping centers, industrial parks, transportation projects, and residential developments.

Under the No Project Alternative, recent development trends are anticipated to continue, leading to impacts on public utilities. Existing land would be converted for residential, commercial, industrial, and transportation infrastructure development to accommodate future growth. These conversions would likely require demolition activities that could result in direct impacts on aboveground and below-ground utilities. Furthermore, these land use conversions would place potential pressures on public utilities. Planned development and transportation projects that would occur under the No Project Alternative would likely include various forms of mitigation to address impacts on public utilities.

Local utilities prepare capital improvement plans to accommodate anticipated population growth. These improvements include utility service infrastructure additions and upgrades, including upgrades to water infrastructure, recycled water infrastructure, and waste management facilities. The SFPUC is currently implementing its Water System Improvement Program (WSIP), which consists of a total of 87 projects, 35 of which are in San Francisco and 52 of which are spread over seven counties from the Sierra foothills to San Francisco. Nearly all of these WSIP projects have been completed. The only remaining WSIP project in San Francisco is upgrades to the Merced Pump Station. The only remaining WSIP regional projects are seven projects that are under construction and the Alameda Creek Recapture Project, which is in its pre-construction phase. The current forecasted date to complete the overall WSIP is December 2021 (SFPUC n.d. (e)). Furthermore, the SFPUC is supplementing and diversifying its water supply portfolio through the development of local water supplies, such as increasing groundwater, recycled water, and nonpotable water production (SFPUC 2016). The SFPUC is also currently working on two new recycled water projects, which would provide recycled water for irrigation to the eastern and western parts of the city (SFPUC 2016). The City of Redwood City recently expanded its recycled water system to the downtown area and is proposing to further expand the system west of US 101 (City of Redwood City n.d.). The City of Mountain View is exploring opportunities to expand the recycled water system (City of Mountain View 2016). Recology, which collects and processes residential, commercial, and municipal waste produced in San Francisco and a portion of Brisbane is proposing to modernize its existing facilities to help meet the San Francisco 2020 goal of zero waste (City of Brisbane n.d.).

### Project Impacts

#### *Construction Impacts*

Construction of the project would include demolition of existing structures to accommodate track modifications and expand existing station areas; clearing and grubbing; handling, storing, hauling, excavating, and placing fill; possible pile driving; and construction and modification of bridges, road modifications, and utility relocations. Construction activities would require water for preparation of concrete, concrete work and earthwork, controlling dust and supplying street-cleaning equipment, and also for landscaping and reseeding of areas temporarily disturbed by construction. Construction would generate wastewater, stormwater, solid waste (including C&D debris) and hazardous waste that would need to be managed by local and regional water and waste management infrastructure. Chapter 2, Alternatives, describes construction activities in more detail.

**Impact PUE#1: Planned and Accidental Temporary Interruption of Utility Service**

Planned, temporary interruption of major utility service to public utility customers could occur during construction at any given location. New utility infrastructure would not be required for Alternative A, since it would rely on the electrical infrastructure that would be built in the PCEP. However, new major nonlinear fixed utility facilities would be constructed for Alternative B (both viaduct options), which would include new electrical infrastructure on the viaduct options in San Jose. Network upgrades required to support Alternative B (both viaduct options) includes the construction of one TPSS (see Figure 3.6-5). Construction of the TPSS may require the temporary shutdown of electric utilities, resulting in the temporary interruption of utility services to customers. Aside from the construction of the new TPSS for Alternative B, the types of construction activities would generally be similar for the project alternatives and would include clearing, grading and excavation, demolition of structures, and operation of cranes and other construction equipment. Construction of both alternatives could require the temporary shutdown of major linear nonfixed utility facilities such as aboveground, below-ground, or overhead electrical transmission lines; natural gas transmission pipeline facilities; petroleum product conveyance facilities; and water conveyance infrastructure. These planned, temporary interruptions of major utility service to public utility customers could occur during construction at any given location and could interrupt utility services to industrial, commercial, and residential customers. As shown in Table 3.6-3, Alternative A has the greater potential for planned temporary interruption of utility services because of the alignment’s proximity to 259 major public utilities within the RSA. Alternative B (Viaduct to I-880) has 239 major public utility lines within the RSA. Alternative B (Viaduct to Scott Boulevard) has 233 major public utility lines within the RSA.

In addition, construction activities could result in the accidental temporary interruption of unknown major linear nonfixed utilities (e.g., electricity, potable water, recycled water, wastewater, natural gas lines). Construction of the project could inadvertently disturb undocumented utility services to industrial, commercial, and residential customers. Impacts could potentially differ between the alternatives and viaduct options because Alternative B (Viaduct to Scott Boulevard) would require more ground disturbance to build a longer viaduct and thus has a greater potential to inadvertently disturb undocumented utilities. However, because the utilities are undocumented, there is difficulty predicting if a particular option or alternative is more at risk than another.

Established practices of utility identification, which would be completed prior to construction, would minimize the potential for accidental disruption. Regulations require development of a construction safety management plan that includes identification and mapping of buried and overhead utility lines (SS-IAMF#2). The contractor would coordinate with utility service providers and local government agencies to identify and map the locations of underground utilities prior to construction and would establish safety and response procedures in the event that a previously unidentified or unmapped underground utility is identified during construction (SS-IAMF#2). In compliance with California law (California Government Code § 4216), the construction contractor would use a utility locator service and manually probe for buried utility lines within the project footprint prior to initiating ground-disturbing activities. Once buried utilities are identified, excavators would be required to physically mark with white paint or other suitable markings their location in the area to be excavated. The contractor would develop a construction safety management plan and a safety and security management plan (SS-IAMF#2) that would establish safety guidelines for construction, including procedures for construction activities in the vicinity of identified overhead or below-ground utility lines. Overhead utility lines would be identified and safety zones established prior to operation of cranes or other overhead equipment that could contact overhead lines. These procedures would minimize the potential for accidental interruption of utility service through construction-related damage to utility lines.

Furthermore, although construction of the project alternatives would result in temporary interruption of utility service, project features would minimize the disruption on utility services. Prior to construction in areas where utility service interruptions would be unavoidable, the contractor would notify the public through a combination of communication media (e.g., phone, email, mail, newspaper notices, or other means) within that jurisdiction and would notify the affected utility service providers of the planned outage (PUE-IAMF#3). The public notifications would specify the estimated duration of the planned outage and would be published no less than 7 days prior to the scheduled outage, in accordance with Cal-ISO requirements (Cal-ISO 2018c). Construction would be coordinated with utility service providers and utility customers to avoid interruptions of utility service to hospitals and other critical users. In addition, prior to construction the contractor would prepare a technical memorandum documenting how construction activities would be coordinated with utility service providers to minimize or avoid interruptions of utility service (PUE-IAMF#4).

#### CEQA Conclusion

There would be a less-than-significant impact under CEQA from planned temporary interruptions of utility service during construction for both the project alternatives. Planned temporary interruptions of utility service would be limited to short durations during construction, and therefore would not require the expansion of existing or construction of new infrastructure, avoiding significant environmental effects. Project features would effectively minimize utility interruptions by identifying utilities prior to construction, coordinating with service providers in advance, notifying the public and affected service providers of any planned outages, and verifying that new facilities are operational prior to disconnecting the original facility. The planned temporary reconstruction or relocation of major nonlinear fixed and linear nonfixed facilities during project construction would be conducted in accordance with the construction safety management plan and safety and security management plan for the project (SS-IAMF#2) and would therefore not result in lengthy or harmful interruptions of service. Accidental interruptions to utility service would be temporary and limited to short durations during construction, and therefore would not require the expansion of existing or construction of new infrastructure, preventing significant environmental effects. The potential for accidental disruption during construction would be minimized as the contractor would be required to verify the location of all underground utilities and confirm their findings with utility service providers (PUE-IAMF#4) prior to construction. Once located, the utilities would be physically marked, on the ground or on drawings, and managed through the construction safety management plan and a safety and security management plan. These measures would minimize or avoid the potential for lengthy accidental interruptions of utility service. The impact from planned utility conflicts would be less than significant under CEQA. Therefore, CEQA does not require mitigation.

### Impact PUE#2: Existing Major Utilities Requiring Relocation or Removal

Construction of the project alternatives would require excavation to support construction of various HSR facilities, and the relocation, extension or protection in place of buried major linear non fixed utility lines (e.g., electrical, natural gas, fuel, communication, and sanitary sewer lines; storm drains) and existing nonlinear fixed transmission facilities (e.g., substations) and aboveground or overhead electric lines, transmission towers, communication lines, and other major utilities (major linear nonfixed facilities). Table 3.6-10 shows the number of major utilities that would be relocated, extended, or protected in place during construction of each project alternative, most of which are major linear nonfixed. Alternative A would require more utility relocations, extensions, and protections in place (259), while Alternative B would require fewer utility relocations, extensions, and protections in place (239 for the Viaduct to I-880 and 233 for the Viaduct to Scott Boulevard). Alternative A would not conflict with a major nonlinear fixed facility; Alternative B (Viaduct to I-880) would conflict with two major nonlinear fixed facilities (two substations), one of which would be relocated and the other of which has a disposition that has yet to be determined; and Alternative B (Viaduct to Scott Boulevard) would conflict with one major nonlinear fixed facility, a substation, which would be relocated. Volume 2, Appendix 3.6-A identifies the owner/operators, types, and locations of major utilities that would be relocated, protected in place, or extended for construction of the project.

**Table 3.6-10 Major Utility Conflicts Resulting in Relocation or Protection in Place**

| Alternative | Utility Relocation | Utility Protection in Place | Utility Extension | Currently Unknown[1] | Total Utility Conflicts |
|---|---|---|---|---|---|
| Alternative A | 53 | 199 | 6 | 1 | **259** |
| Alternative B (Viaduct to I-880) | 76 | 151 | 11 | 1 | **239** |
| Alternative B (Viaduct to Scott Boulevard) | 72 | 150 | 11 | 0 | **233** |

I- = Interstate
[1] The column labelled "Currently Unknown" identifies the major utility conflicts for which it is currently unknown if the utility would require relocation, protection in place, or extension.

Pursuant to utility agreements negotiated between the Authority and the utility service providers, the Authority would work with utility owners during final engineering design and construction of the project to relocate utilities to outside of the right-of-way, abandon the utilities in place within the right-of-way, or protect the utilities in place within the right-of-way. Where overhead distribution lines cross the alignment, the Authority and the utility service provider may decide to place the line below ground or protect the line in place to avoid potential conflict with HSR operations. Utilities that would need to be relocated outside of the right-of-way would be replaced or reinstalled in cooperation with utility service providers so as not to affect utility services to customers. Relocations and reinstallation of utilities would be conducted by the contractor in cooperation with the utility service providers in accordance with design standards and regulatory requirements, including CPUC General Order 131-D for electrical systems. General Order 131-D requires electric utility service providers to obtain permits to build electric power lines or substations designed for operation between 50 kV and 200 kV or new or upgraded substations with high side voltage exceeding 50 kV. Minor relocation of existing power lines up to 2,000 feet long and conversion of overhead utilities to below-ground utilities are exempt from General Order 131-D permit to construct requirements.

The relocation, protection in place, and extension of utilities due to the project could result in interruption of utility service. The Authority would, however, coordinate with utility service providers and utility customers to avoid interruptions of utility service to hospitals and other critical users. In addition, prior to construction the contractor would prepare a technical memorandum documenting how construction activities would be coordinated with utility service providers to minimize or avoid interruptions of utility service (PUE-IAMF#4). The Authority would also be required to notify the public through a combination of communication media (e.g., phone, email, mail, newspaper notices) of any unavoidable utility service interruptions (PUE-IAMF#3).

#### CEQA Conclusion

Most potential conflicts with existing major utilities would be with linear nonfixed facilities for both alternatives. Alternative A would not affect any major nonlinear fixed facilities; however Alternative B (Viaduct to I-880) would affect two major nonlinear fixed facilities (two substations); and Alternative B (Viaduct to Scott Boulevard) would affect one major nonlinear fixed facility (one substation). Nonetheless, all conflicts would be a less-than-significant impact under CEQA for both project alternatives because existing major utilities would be permanently relocated or protected in place through agreements between the Authority and utility service providers. The contractor would conduct relocations and reinstallation of utility lines, in cooperation with the utility service provider, in accordance with design standards and regulatory requirements including

CPUC General Order 131-D for electrical systems and would notify the public. Through effective coordination in the planning and implementation of major utilities relocations, conflicts between project construction and major utilities would be minimized and would not result in lengthy and harmful interruption of service, impacts on utility service providers or customers or the construction or relocation of which could cause significant environmental effects. The impact from major utilities requiring relocation or removal would be less than significant under CEQA. Therefore, CEQA does not require any mitigation.

### Impact PUE#3: Reduced Access to Existing Utilities in the HSR Right-of-Way

Appendix 3.6-A in Volume 2 identifies existing utilities within the right-of-way. Utilities, including electrical, natural gas, petroleum, communication, water supply, storm drain, and sanitary sewer lines exist within the Caltrain right-of-way. Construction of the project would require that the right-of-way be permanently fenced and secured to prevent unauthorized access to the right-of-way. There is existing fencing surrounding most of the Caltrain right-of-way; therefore, additional fencing installed as part of the project would not substantially reduce access to existing utilities.

As discussed under Impact PUE#2, any major underground utilities that conflict with the HSR right-of-way either would be relocated or would be reinforced underneath the HSR right-of-way inside a casing pipe strong enough to carry the HSR facilities and allowing for utility maintenance access from outside the HSR right-of-way. Utility lines that would require routine maintenance by utility service providers would be removed or relocated and would not remain within the HSR right-of-way after completion of construction. Project features include effective measures to address utility owners’ access needs and would protect and maintain continued controlled access to utility lines remaining within the right-of-way during and after construction by coordinating and scheduling utility service provider field visits with the property owner in advance. It is common practice that utility districts coordinate and schedule in advance any field visits to their facilities with the owner of the property within which their facilities lie. Thus, the utility district would still be able to access any existing utilities remaining within the HSR right-of-way.

#### CEQA Conclusion

There would be a less-than-significant impact under CEQA on access to utilities remaining in the right-of-way after completion of construction. The project alternatives would not reduce access to existing utilities in the HSR right-of-way because existing major utilities within the HSR right-of-way would be relocated or protected in place, such that maintenance of relocated utilities could occur outside the HSR right-of-way and the utility owners would still be able to access any existing utilities protected in place and remaining within the HSR right-of-way. Project features include effective measures to address utility owners’ access needs; these measures would protect and maintain continued controlled access to utility lines remaining within the right-of-way during and after construction by coordinating and scheduling utility service provider field visits with the property owner in advance. Thus, neither alternative would result in the construction or expansion of electrical facilities; the relocation of nonlinear fixed facilities; or the reconstruction or relocation of a major linear nonfixed facility, due to reduced access to existing utilities. The alternatives would not result in lengthy and harmful interruptions of service due to reduced access or require or result in the construction of new utility facilities or expansion and upgrade of existing utility facilities that could cause significant environmental effects. Thus, the impact from reduced access would be less than significant. Therefore, CEQA does not require any mitigation.

### Impact PUE#4: Temporary Impacts from Construction of New Utility Infrastructure

Although both project alternatives would primarily rely on the electrical infrastructure that would be built as part of PCEP, new electrical infrastructure would be required for both alternatives. Network upgrades required to support both alternatives include the construction of a new electrical substation near the Brisbane LMF (see Figure 3.6-1). In addition, a new TPSS (see Figure 3.6-5), approximately 32,000 square feet (200 feet by 160 feet), would be built to support Alternative B (both viaduct options) along with overhead contact system (OCS) infrastructure on viaduct structures in the San Jose Diridon Station Approach Subsection under Alternative B. All network upgrades would be implemented pursuant to CPUC General Order 131-D (Rules

Relating to the Planning and Construction of Electric Generation, Transmission Power Distribution Line Facilities and Substations Located in California).

**CEQA Conclusion**

The impact would be less than significant under CEQA for both alternatives for temporary impacts from construction of new utility infrastructure. While construction of both alternatives would require new utility infrastructure, this would not cause significant environmental effects because all network upgrades would be implemented pursuant to CPUC General Order 131-D. The construction of both alternatives would also not result in a permanent adverse effect on utility services to utility customers. Therefore, CEQA does not require mitigation.

### Impact PUE#5: Temporary Impacts from Water Use

Construction of the project would require water to prepare concrete, increase the water content of soil to optimize compaction, clean equipment, control dust, and reseed disturbed areas; and conduct drilling and other ground excavation activities. The water use for construction of the project was estimated based on the number of water trucks anticipated to be required during construction. Water use for construction would be approximately 257 million gallons for Alternative A, 290 million gallons for Alternative B (Viaduct to I-880), and 342 million gallons for Alternative B (Viaduct to Scott Boulevard). The primary difference in water use between the project alternatives would occur in the San Mateo to Palo Alto Subsection—Alternative B includes the construction of passing tracks, which would not be built under Alternative A, and in the San Jose Diridon Station Approach Subsection for water consumption for construction of the viaduct to I-880 or Scott Boulevard.

A variety of water sources would be available from water suppliers in the RSA to provide water for construction-related activities. The water in the RSA is supplied by the SFPUC and different jurisdictions distribute water to their customers. In addition, several jurisdictions within the RSA, including the Cities of Millbrae, Burlingame, Redwood City, Palo Alto, Mountain View, Sunnyvale, and Santa Clara generate recycled water. When available, reclaimed nonpotable water would be used for dust control and landscaping. This water would be obtained from private vendors, delivered in trucks, and stored in tanks that could be moved to construction work sites. This use would not result in increased temporary demand on local potable water supplies during the construction period. For other construction water uses for which potable water is required, water conservation design features would be implemented. The design-build contractor would prepare a water conservation plan that clearly describes how water conservation would be incorporated in the design and construction of the project. Water use during construction would be in compliance with the Authority's Water Conservation Guidance (Authority 2015).

Table 3.6-11 provides a comparison between existing daily water use and the construction water use that would be required for each subsection of the project alternatives. Construction of either project alternative would increase water demand at a rate equivalent to a small percentage of the existing water use. Construction of Alternative A would require 0.15 percent of the water that was used by local jurisdictions in 2015, construction of Alternative B (Viaduct to I-880) would require 0.16 percent of the water that was used by local jurisdictions in 2015, and construction of Alternative B (Viaduct to Scott Boulevard) would require 0.22 percent of the water that was used in 2015. Additional information regarding existing water use and anticipated water use for the project alternatives is summarized in Volume 2, Appendix 3.6-C.

Construction of the project would occur between 2021 and 2026. To account for the period of construction, the projected water demand for 2030 has been used in this analysis. SFPUC approximates that in 2030 the water demand for wholesale customers would be approximately 167,400,000 gpd of water of the 184,000,000-gpd supply (SFPUC 2016). Thus, in 2030, a total of approximately 16,600,000 gpd of the wholesale water supply would still be available. The increase in water demand for construction would represent 1.5 percent of the available water supply in 2030 for Alternative A; 1.6 percent of the available water supply in 2030 for Alternative B (Viaduct to I-880); and 2.1 percent of the available water supply in 2030 for Alternative B (Viaduct to Scott Boulevard).

**Table 3.6-11 Daily Construction Water Use Summary by Alternative**

| County | Daily Water Use (mgd) | | |
|---|---|---|---|
| | Existing Use (2015) | Construction Use[1] | Percent of Existing Use |
| **Alternative A** | | | |
| San Francisco to South San Francisco Subsection | 76.5 | 0.05 | 0.07 |
| San Bruno to San Mateo Subsection | 12.7 | 0.04 | 0.31 |
| San Mateo to Palo Alto Subsection | 37.7 | 0.06 | 0.16 |
| Mountain View to Santa Clara Subsection | 17.2 | 0.04 | 0.23 |
| San Jose Diridon Station Approach Subsection | 14.0 | 0.05 | 0.4 |
| **Total** | **158.1** | **0.24** | **0.15** |
| **Alternative B[2]** | | | |
| San Francisco to South San Francisco Subsection | 76.5 | 0.05 | 0.07 |
| San Bruno to San Mateo Subsection | 12.7 | 0.04 | 0.31 |
| San Mateo to Palo Alto Subsection | 37.7 | 0.09 | 0.24 |
| Mountain View to Santa Clara Subsection | 17.2 | 0.04 | 0.23 |
| San Jose Diridon Station Approach Subsection | 14.0 | 0.04/0.12 | 0.3/0.9 |
| **Total** | **158.1** | **0.26/0.34** | **0.16/0.22** |

*Sources: SFPUC 2016; Authority 2019a; City of San Jose 2016a*
I- = Interstate
mgd = million gallons per day
[1] The construction water use was estimated in mgd by dividing the total amount of water that would be used for the San Francisco to South San Francisco Subsection; San Bruno to San Mateo Subsection; San Mateo to Palo Alto Subsection; Mountain View to Santa Clara Subsection by the number of working days (1,235 working days). The construction water use for the San Jose Diridon Station Approach Subsection was estimated in mgd by dividing the total amount of water that would be used by the number of working days (652 working days).
[2] Where applicable, values are presented for Alternative B (Viaduct to I-880) first, followed by Alternative B (Viaduct to Scott Boulevard). If only one value is presented, the value would be identical under both Alternative B viaduct options.

In addition, during a single dry year, the water supply would be equal to 90 percent of the water supply for a normal year, according to the SFPUC (SFPUC 2016). In a single dry year, the remaining water supply would be approximately 14,940,000 gpd.[7] The increase in water demand for construction would represent 1.6 percent of the available water supply in 2030 (during a single dry year) for Alternative A; 1.7 percent of the available water supply in 2030 (during a single dry year) for Alternative B (Viaduct to I-880); and 2.3 percent of the available water supply in 2030 (during a single dry year) for Alternative B (Viaduct to Scott Boulevard). During multiple dry years (2 years and 3 years), the water supply would be equal to 78 percent of the water supply for a normal year (SFPUC 2016). During multiple dry years, the remaining water supply would be approximately 12,948,000 gpd.[8] The increase in water demand for construction would represent 1.9 percent of the available water supply in 2030 (during multiple dry years) for Alternative A; 2.0 percent of the available water supply in 2030 (during multiple dry years) for Alternative B (Viaduct to I-880); and 2.6 percent of the available water supply in 2030 (during multiple dry years) for Alternative B (Viaduct to Scott Boulevard).

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[7] 14,940,000 = 0.90 * 16,600,000
[8] 12,948,000 = 0.78 * 16,600,000

#### CEQA Conclusion

There would be a less-than-significant impact under CEQA from temporary water use during project construction. Through implementation of a water conservation plan and compliance with the Authority's Water Conservation Guidance (Authority 2015), project features (including water conservation and use of nonpotable and recycled water for construction activities) would minimize water use during construction. The project would result in a temporary increase in water use; however, this increase would be small relative to existing demand (0.15 percent of 2015 water use for Alternative A, 0.16 percent of 2015 water use for Alternative B [Viaduct to I-880] and 0.22 percent of 2015 water use for Alternative B [Viaduct to Scott Boulevard]). In addition, the temporary increase in water use for Alternative A and B (both viaduct options) would be small relative to the projected available supply in 2030 for normal, dry, and multiple dry years (between 1.5 percent and 2.6 percent). Thus, there is sufficient water supply to accommodate construction water use and reasonably foreseeable future development during normal, dry, and multiple dry years. The impact on water supplies from construction water use would be less than significant under CEQA. Therefore, CEQA does not require mitigation.

### Impact PUE#6: Temporary Impacts from Wastewater and Stormwater Generation

#### Wastewater

Construction of the project would generate wastewater from two sources:

1. Wastewater generated from cleaning equipment, controlling dust, reseeding disturbed areas, and conducting drilling and other ground excavation activities.
2. Temporary dewatering in areas with a shallow depth to groundwater.

The water used to clean equipment, control dust, and conduct ground excavation in construction areas would generate wastewater from water runoff. The water to prepare concrete, to optimize compaction, and reseed disturbed areas would generally not generate wastewater. The quantity of wastewater that would be generated during construction is currently unknown, but would be less than the amount of water used during construction. The amount of water required for construction would be 0.24 mgd for Alternative A, 0.26 mgd for Alternative B (Viaduct to I-880), and 0.34 mgd for Alternative B (Viaduct to Scott Boulevard). Thus, the amount of wastewater that would be generated from cleaning equipment, controlling dust, and conducting ground excavation would be less than 0.24 mgd for Alternative A, 0.26 mgd for Alternative B (Viaduct to I-880), and 0.34 mgd for Alternative B (Viaduct to Scott Boulevard).

During construction of the project, temporary dewatering could be required in some locations in the RSA because of the shallow depth to groundwater (see Section 3.8). Dewatering operations may also be needed when construction requires the removal of accumulated precipitation or nonstormwater from a construction work location. Dewatering operations may occur during demolition of existing structures, grading, excavation, and construction of new structures. At this time, it is unknown how much wastewater would be generated from dewatering activities.

Table 3.6-4 shows the design capacities of municipal WWTPs in the public utilities RSA. As shown in Table 3.6-4, the remaining daily dry-weather capacity at the WWTPs in the RSA is approximately 224.4 mgd. There is sufficient capacity at WWTPs to treat the wastewater generated from construction and dewatering activities assuming that 100 percent of the construction-related water used for the project becomes wastewater. Construction-related wastewater generation for Alternative A and Alternative B (Viaduct to I-880) would be approximately 0.1 percent of the total wastewater treatment capacity in the public utilities RSA. Construction-related wastewater generation from Alternative B (Viaduct to Scott Boulevard) would be approximately 0.15 percent of the total wastewater treatment capacity in the public utilities RSA. Although the amount of wastewater generated from dewatering is unknown, it is expected to be minor and it is expected that there is sufficient wastewater treatment capacity (224.4 mgd) to accommodate this minor amount of wastewater.

Wastewater generated from construction activities could be discharged to existing WWTPs. During dewatering, wastewater (i.e., extracted water) could be discharged directly into the local sanitary sewer system or to a surface waterbody. Discharge of water from dewatering activities may be subject to NPDES permit and Construction General Permit (CGP) requirements. Direct discharge of wastewater into the local sanitary sewer system would only occur if the receiving wastewater treatment facility approves such disposal. Because the local wastewater treatment authority must approve any disposal of extracted water through the sewer system, it is assumed this would only be allowed if there is adequate wastewater treatment capacity. If wastewater is discharged to the sewer, the wastewater treatment service provider would establish allowable flow rates, volumes, and frequency subject to a discharge permit. Alternately, extracted water could be discharged to a surface waterbody in accordance with an individual Waste Discharge Requirement/NPDES permit that would be issued by the RWQCB. The project is entirely within the jurisdiction of the San Francisco Bay RWQCB (Region 2). Water quality discharge permit conditions for discharges to surface water would be established in accordance with the water quality objectives and other provisions of the Regional Board Water Quality Control Plan for the San Francisco Bay RWQCB Region (San Francisco Bay RWQCB 2017).

#### Stormwater

The project would minimize potential temporary impacts on stormwater management system capacity by managing and controlling stormwater and resulting runoff and erosion and pollution from stormwater discharges. Temporary ground-disturbing activities from construction that could result in temporary changes to drainage patterns and stormwater runoff would be effectively minimized through development and implementation by the contractor of the following:

- Implementation of a stormwater pollution prevention plan (SWPPP), per HYD-IAMF#3.
- Compliance with the San Francisco Bay RWQCB's dewatering requirements and dewatering plans that would be approved by the regulatory agencies (HYD-IAMF#3, GEO-IAMF#1).
- Regular monitoring and enforcement of construction site permit conditions related to dewatering and diversion sites (BIO-IAMF#1).

The contractor would prepare and implement a construction SWPPP prior to construction under the CGP, including design features to minimize or avoid impacts on stormwater management facility capacity from the generation of stormwater (HYD-IAMF#3). The contractor's implementation of the SWPPP would provide best management practices (BMP) that would minimize potential short-term increases in stormwater generation and sediment transport caused by construction, including BMPs for erosion control requirements, stormwater management requirements, and channel dewatering for affected stream crossings. These BMPs would provide permeable surfaces where feasible and systems to retain or detain and treat stormwater from construction areas on-site. The SWPPP under the CGP for construction of the project would include BMPs that would minimize discharges of sediment from the construction site and manage construction equipment and materials to prevent leaks, spills, and accidental discharges to stormwater management facilities. These project features would reduce the amount of construction-area water discharged to stormwater management systems and would therefore reduce the impacts on the capacity of existing stormwater management system facilities managed by local stormwater management authorities. In addition, these project features would improve the quality of the stormwater discharge from construction areas by requiring the contractor to develop and implement the SWPPP under the CGP.

Each local stormwater management jurisdiction under the local jurisdiction's CGP program would permit stormwater discharges from project construction sites. Implementation of SWPPPs for construction sites and conformance of the project construction with local jurisdiction municipal separate storm sewer system (MS4) permit requirements and RWQCB requirements would minimize generation of stormwater from project construction. The Authority would use California Stormwater Quality Association BMP handbook or equivalent to comply with the conditions of applicable Phase II MS4 permits within its right-of-way. In accordance with the SWPPP and applicable permit requirements, temporary stormwater management structures would be constructed as needed so the capacity of existing stormwater management systems would not be exceeded.

#### CEQA Conclusion

There would be a less-than-significant impact under CEQA from temporary wastewater generation during construction, including wastewater generated from cleaning equipment, controlling dust, reseeding disturbed areas, and conducting drilling and other ground excavation activities for both alternatives. Construction would cause temporary increases in wastewater generation; however, the amount of wastewater that would be generated during construction would be minor relative to the available capacity for wastewater treatment in the area. The amount of temporary wastewater generation from construction activities would not exceed available wastewater treatment capacity or require expansion or new construction of wastewater treatment facilities. The estimated amount of construction-related wastewater generation (0.24 mgd for Alternative A and 0.26 mgd for Alternative B [Viaduct to I-880]) would be approximately 0.1 percent of the total wastewater treatment capacity in the public utilities RSA (224.4 mgd) and the estimated amount of construction-related wastewater generation (0.34 mgd) for Alternative B (Viaduct to Scott Boulevard) would be approximately 0.15 percent of the total wastewater treatment capacity in the public utilities RSA. There is sufficient capacity for the existing wastewater treatment providers to serve the project's projected demand in addition to its existing commitments and the project does not require the construction of new or expansion of existing wastewater facilities. As a result, the impact from temporary wastewater generation during construction would be less than significant under CEQA. Furthermore, because the wastewater generated during construction would be treated at existing wastewater facilities that are required to comply with RWQCB regulations, the wastewater generated during construction would not exceed RWQCB wastewater treatment requirements and the impact would be less than significant. Therefore, CEQA does not require any mitigation.

In addition, the project could result in runoff, erosion, and pollution from stormwater discharges during construction. There would be a less-than-significant impact under CEQA from temporary stormwater generation during construction. Temporary impacts on drainage patterns and stormwater runoff during construction are described in Section 3.8 under Impact HYD#1. Project features, including implementation of the SWPPP and conformance with the CGP and local wastewater management jurisdiction permit requirements, would minimize stormwater generation from construction activities. In accordance with the SWPPP and applicable permit requirements, temporary stormwater management structures would be constructed as needed such that the capacity of existing stormwater management systems would not be exceeded. These project features would minimize temporary impacts from wastewater generation on water use and demands and capacities of local WWTPs and stormwater management facilities. The project would not require the construction of new stormwater drainage facilities or expansion of existing WWTPs and stormwater management facilities during construction, the construction of which would cause significant environmental effects; therefore, the impact would be less than significant. Therefore, CEQA does not require any mitigation.

### Impact PUE#7: Temporary Generation of Solid Waste and Hazardous Wastes

#### Nonhazardous Solid Waste

Construction of the project alternatives would generate solid waste from clearing of vegetation, grading, demolition of existing structures, and cut-and-fill construction activities. Estimated earthwork volumes for construction of the alternatives are summarized in Table 2-22. Construction of Alternative A would include earthwork activities that would generate approximately 2,262,800 cubic yards of surplus excavation material (Authority 2019b, 2019c). Approximately 26 percent of the excavated material would be reused (see Table 2-22), which means that approximately 74 percent of this excavated material (1,674,472 cubic yards) would require disposal. Construction of Alternative B (both viaduct options) would include earthwork activities that would generate approximately 1,623,700 cubic yards of solid waste (Authority 2019b, 2019c). Construction of the passing track under Alternative B (both viaduct options) would allow for the reuse of 100 percent of the excavated material; therefore, the solid waste generated from earthwork activities for Alternative B (both viaduct options) would not require disposal.

Construction of the project alternatives would also generate C&D debris from the demolition of existing buildings. Alternative A would generate approximately 75,170 cubic yards of C&D debris from building demolition, Alternative B (Viaduct to I-880) would generate approximately 154,380 cubic yards of C&D debris from building demolition, and Alternative B (Viaduct to Scott Boulevard) would generate approximately 171,700 cubic yards of C&D debris from building demolition (Authority 2019a).

Solid waste (i.e., C&D debris) generated from building demolition activities may not be reusable or recyclable and may therefore need to be disposed of in solid waste landfills. Table 3.6-12 shows solid waste landfill capacity by facility and estimated solid waste generation from construction activities by project alternative. Solid waste landfills in the RSA in the vicinity of San Francisco, San Mateo, and Santa Clara Counties could be used for nonhazardous solid waste disposal. Collectively these nonhazardous solid waste landfills have an estimated remaining disposal capacity of over 70 million cubic yards. The closest landfill to the project site is the Corinda Los Trancos Landfill in San Mateo County; thus, it is likely that most of the solid waste would be sent to this facility. The Corinda Los Trancos Landfill has a remaining capacity of approximately 22 million cubic yards and an estimated closure date of 2034.

**Table 3.6-12 Solid Waste (Construction and Demolition Debris) Generation Estimates by Alternative in Cubic Yards**

| Estimated Solid Waste (C&D Debris) Generation from Building Demolition by Alternative[1] | |
|---|---|
| Alternative A | Alternative B[2] |
| 1,749,642 cubic yards | 154,380 cubic yards/<br>171,700 cubic yards |

| Solid Waste Landfill Facility and Capacity | | | |
|---|---|---|---|
| | | Sufficient Remaining Capacity? | |
| Remaining Landfill Capacity (cubic yards) | | Alternative A | Alternative B[2] |
| Corinda Los Trancos Landfill (Ox Mountain Sanitary) | 22,180,000 | yes | yes |
| Kirby Canyon Recycling and Disposal Facility | 16,191,000 | yes | yes |
| Guadalupe Community Facility | 11,055,000 | yes | yes |
| Newby Island Sanitary Landfill | 21,200,000 | yes | yes |

*Source: CalRecycle 2018b; Authority 2019a*
C&D = construction and demolition
I- = Interstate
[1] Solid waste generation values are for C&D debris that would be generated from building and other demolition activities and that would be disposed of in licensed a C&D debris landfill.
[2] Values are presented for Alternative B (Viaduct to I-880) first, followed by Alternative B (Viaduct to Scott Boulevard)

Alternative A would require the use of landfill facilities substantially more than Alternative B (both viaduct options). The amount of solid waste (C&D debris) that would be generated from building demolition and from excavation during construction of Alternative A would comprise a total of 1,749,642 cubic yards[9], which is only 8.0 percent of the remaining capacity at Los Trancos Landfill. In addition to this, there are additional solid waste facilities in the Bay Area with remaining capacity that could serve the project for disposal of C&D debris from building demolition and solid waste from excavation. As shown in Table 3.6-5, landfills in the area have a remaining capacity of approximately 267 million cubic yards (not including the Corinda Los Trancos Landfill). The solid waste generated by Alternative A (1,749,642 cubic yards) is 0.7 percent of the remaining capacity of these additional landfills in the area.

[9] 1,674,472 + 75,170 = 1,749,642

The amount of solid waste that would be generated from building demolition during construction of Alternative B (Viaduct to I-880) would comprise 0.7 percent of the remaining capacity at Los Trancos Landfill and Alternative B (Viaduct to Scott Boulevard) would comprise 0.8 percent of the remaining capacity at Los Trancos Landfill. The Los Trancos Landfill has sufficient capacity to accommodate the C&D debris anticipated to be generated by building demolition for the project for both project alternatives. Furthermore, there are additional solid waste facilities in the Bay Area with remaining capacity that could serve the project for disposal of C&D debris from building demolition.

#### Hazardous Solid Waste

Construction would generate hazardous waste consisting of welding materials, fuel and lubricant containers, paint and solvent containers, treated wood, and cement products containing strong basic or acidic chemicals. Demolition of older buildings could also generate hazardous waste, such as asbestos-containing materials and lead-based paint.

Most of the excavation for construction of the project alternatives would occur at the site of the Brisbane LMF. Some of the solid waste generated during earthwork activities for each project alternative may be contaminated as a result of the former industrial and freight uses of the site of the West Brisbane LMF under Alternative B. For Alternative B, the Authority estimated that approximately 432,000 cubic yards of the solid waste generated during earthwork activities may be contaminated and require special disposal as hazardous waste (Authority 2019a). It is anticipated that Alternative A would not generate substantial quantities of hazardous waste during construction grading and excavation because construction of Alternative A would not involve excavation and grading of identified areas of contaminated soil; therefore, Alternative A would not have an additional demand or impact on hazardous waste facilities from excavation and grading activities.

It is currently unknown how much of the demolition debris would be considered hazardous. However, the amount of hazardous waste generation from building demolition activities is assumed to be no greater than the amount of nonhazardous solid waste (C&D debris) generation from building demolition activities for the purposes of comparison to available hazardous waste disposal capacity. Both Alternative A and Alternative B are anticipated to generate hazardous waste from building demolition activities. For the purposes of comparison to available hazardous waste landfill disposal capacity, the amount of hazardous waste that would be generated from building demolition activities is assumed to be equal to the amount of C&D debris that would be generated from building demolition activities, i.e., Alternative A would generate 75,170 cubic yards of hazardous waste. Alternative B (Viaduct to I-880) would generate 154,380 cubic yards of hazardous waste, and Alternative B (Viaduct to Scott Boulevard) would generate 171,700 cubic yards of hazardous waste.

Thus, in total, Alternative A would potentially generate 75,170 cubic yards of hazardous solid waste; Alternative B (Viaduct to I-880) would potentially generate 586,380 cubic yards[10] of hazardous solid waste; and Alternative B (Viaduct to Scott Boulevard) would potentially generate 603,700 cubic yards[11] of hazardous solid waste.

There are three RCRA-permitted hazardous waste landfills in California—the Kettleman Hills Facility in Kings County; the Clean Harbors Facility in Buttonwillow in Kern County; and the Clean Harbors Facility in Westmorland in Imperial County (DTSC n.d.). Table 3.6-13 shows the capacity at the three hazardous waste landfills that could be used by the project.

Based on the estimated 14.9 million cubic yards of available hazardous waste landfill capacity for the three hazardous waste landfills in Kern County, Imperial County, and Kings County, hazardous waste landfill capacity within California would be adequate for the anticipated 75,170 cubic yards of hazardous waste that would be generated by construction of Alternative A, the 586,380 cubic yards of hazardous waste that would be generated by construction of Alternative B

[10] 432,000 + 154,380 = 586,380

[11] 432,000 + 171,700 = 603,700

(Viaduct to I-880), including the 432,000 cubic yards anticipated to be generated from excavation and grading activities, and the 603,700 cubic yards of hazardous waste that would be generated by construction of Alternative B (Viaduct to Scott Boulevard) including the 432,000 cubic yards anticipated to be generated from excavation and grading activities.

**Table 3.6-13 Hazardous Waste Generation Estimates by Alternative in Cubic Yards**

| Estimated Hazardous Waste Generation by Alternative | |
|---|---|
| Alternative A | Alternative B[1] |
| 75,170 cubic yards | 586,380 cubic yards/ 603,700 cubic yards |

| Hazardous Waste Landfill Facility and Capacity | | | |
|---|---|---|---|
| Remaining Landfill Capacity (cubic yards) | | Sufficient Remaining Capacity? | |
| | | Alternative A | Alternative B[1] |
| Kettleman Hills Landfill, Kettleman City CA | 4.9 million | yes | yes |
| Clean Harbors Landfill, Buttonwillow CA | 5 million (estimated) | yes | yes |
| Clean Harbors Westmorland Landfill, Westmorland CA | 5 million | yes | yes |

*Sources: Clean Harbors 2017a, 2017b; Authority 2019a*
[1] Values are presented for Alternative B (Viaduct to I-880) first, followed by Alternative B (Viaduct to Scott Boulevard)

The 75,170 cubic yards of hazardous waste generated by construction of Alternative A would comprise an estimated 0.5 percent of remaining hazardous waste landfill disposal capacity. The 586,380 cubic yards of hazardous waste generated by construction of Alternative B (Viaduct to I-880) including the 432,000 cubic yards anticipated to be generated from excavation and grading activities would comprise an estimated 3.9 percent of remaining capacity. The 603,700 cubic yards of hazardous waste generated by construction of Alternative B (Viaduct to Scott Boulevard) including the 432,000 cubic yards anticipated to be generated from excavation and grading activities would comprise an estimated 4.1 percent of remaining capacity.

The Authority's Sustainability Policy would minimize the amount of solid waste generated during construction by requiring construction waste practices that divert at least 75 percent from a landfill. Furthermore, the Authority would develop and implement a demolition plan, which would include procedures to identify and minimize generation of hazardous waste from C&D activities (HMW-IAMF#5). Prior to demolition activities, the contractor would evaluate whether the structures proposed for demolition contain asbestos or lead, in accordance with federal regulatory requirements including 15 United States Code Section 2601 et seq. General personal protection practices would also be implemented as part of HMW-IAMF#5 and in accordance with California Division of Occupational Safety and Health regulatory requirements. Implementation of the demolition plan would promote segregation of asbestos and lead-containing waste from nonhazardous solid waste, and would therefore reduce the amount of hazardous waste generated from demolition activities and the need for hazardous waste disposal capacity.

**CEQA Conclusion**

There would be a less-than-significant impact under CEQA from temporary solid waste generation during construction and a less-than-significant impact from temporary hazardous waste generation during construction. Construction of the project would not generate solid waste in excess of state or local standards or in excess of the capacity of local infrastructure, and would not impair the attainment of state or local solid waste reduction goals.

Solid waste facilities and hazardous waste facilities within the RSA would have sufficient permitted capacity to accept solid and hazardous waste generated by project construction, and the CEQA impact from temporary solid and hazardous waste generation would be less than significant. There would be a less-than-significant impact under CEQA from solid and hazardous waste generation and disposal during construction for any of the alternatives because solid waste produced would not exceed the permitted disposal capacity of existing solid waste disposal facilities in the RSA and hazardous waste generation would not exceed the permitted disposal capacity of existing hazardous waste disposal facilities in California. Therefore, the project would not require construction and permitting of any new solid waste disposal or hazardous waste disposal infrastructure, and the CEQA impact would be less than significant. Impacts from hazardous wastes would be avoided through safe handling and disposal procedures. Solid waste, including solid waste produced during grading and cut-and-fill activities, would be reused where applicable, while any additional solid wastes would be sent to proper disposal facilities (landfills). Solid waste and hazardous waste disposal procedures would comply with federal, state, and local statutes and regulations related to solid waste and hazardous waste management and the CEQA impact would be less than significant. Therefore, CEQA does not require mitigation.

The Authority would require construction contractors to prepare demolition plans with specific provisions for the safe dismantling and removal of building components and debris and segregation and management of solid and hazardous waste generated in accordance with regulatory requirements. The demolition plans would include requirements for identification and abatement of lead and asbestos hazards for commercial and industrial buildings and roadways slated for demolition or renovation (HMW-IAMF#5). As part of the project design (HMW-IAMF#7, HMW-IAMF#8, HMW-IAMF#10), the contractor would comply with regulations that control the disposal of hazardous materials and hazardous wastes generated during construction. The contractor would implement a written hazardous materials and waste management plan that would describe responsible parties and procedures for hazardous waste transport, containment, storage and disposal and hazardous material and hazardous waste management BMPs (HMF-IAMF#7, HMW-IAMF#8, HMW-IAMF#10). The contractor would implement procedures to safely dispose of hazardous waste and separate hazardous wastes from nonhazardous wastes to reduce the amount of hazardous waste generated, including procedures to identify potential asbestos-containing structures and lead-containing structures prior to demolition, abatement of lead and asbestos hazards, and segregation of hazardous and nonhazardous wastes. Through implementation of IAMFs, construction of the alternatives would not create a significant hazard to the public or the environment through the routine disposal of hazardous materials and there would be a less-than-significant impact. Therefore, CEQA does not require mitigation.

#### *Operations Impacts*

Operation of the project alternatives would include operation of HSR trains, stations, and the Brisbane LMF and maintenance of the trains, track, and right-of-way. Operation of the project would result in the consumption of water for operation of stations and the LMF and the generation of wastewater, solid wastes, and hazardous wastes from operation of stations and the LMF. Runoff of precipitation on impervious surfaces in the right-of-way and at stations and the LMF would generate stormwater. Chapter 2 describes operations activities in more detail.

#### Impact PUE#8: Continuous Permanent Impacts from Water Use

The 4th and King Street Station, Millbrae Station, San Jose Diridon Station, and the Brisbane LMF would require operational water supply for a variety of uses, including drinking fountains and restrooms, landscaping irrigation, and station and facility maintenance wash water. The operational water use for these stations and LMF would be the same for the project alternatives. Table 3.6-14 shows the additional water that would be required for HSR daily operation at the 4th and King Street Station, Millbrae Station, San Jose Diridon Station, and LMF compared to the existing water use for these facilities.

The expanded San Jose Diridon Station would require additional water for restroom facilities, drinking water fountains, and cleaning and station maintenance activities in addition to the existing water demand for the station. The estimated average potable water demand for the San Jose Diridon Station after expansion would be 24,200 gpd, (includes existing water usage and usage that would result from the expanded station) two-thirds of which would be potable water use within the station (16,025 gpd) and one-third of which would be used for landscaping and other outdoor use (8,150 gpd). The existing San Jose Diridon Station used 5,400 gpd of water in 2016 for indoor and outdoor uses.

**Table 3.6-14 Operational Water Use**

| Project Component | Existing Water Use (gpd) | Additional Water Use due to Project (gpd) | Total Water Use for Existing Plus Project (gpd) |
|---|---|---|---|
| 4th and King Street Station | 4,145.2 | 2,048.2 | 6,193.4 |
| Millbrae Station | 7,519.9 | 5,943.5 | 13,463.4 |
| East or West Brisbane LMF | 0.0 | 105,732.0 | 105,732.0 |
| San Jose Diridon Station | 5,400 | 18,800 | 24,200 |
| **Total** | **17,055.1** | **132,523.7** | **149,588.8** |

gpd = gallons per day
Actual project consumption would be lower because stations would be LEED platinum.

As shown in Table 3.6-14, operation of HSR service at existing stations would increase the water demand by approximately 27,000 gpd. Operation of the LMF would require water for cleaning of trains before departure and between HSR train trips; maintenance; and for wheel truing. Operation of the LMF would also require water for operation of the workshop and office space in the LMF. Operation of the LMF would require approximately 106,000 gpd. The total increase in water demand for the modified stations and the LMF would be approximately 132,500 gpd.

Operation of the project would occur as early as 2029 or up to 2040. To account for the range in operational start dates, the projected water demands for 2030 and 2040 have both been used in this analysis.

SFPUC approximates that in 2030 the water demand for wholesale customers would be approximately 167,400,000 gpd of water of the 184,000,000-gpd supply (SFPUC 2016). Thus, in 2030, a total of approximately 16,600,000 gpd of the wholesale water supply would still be available. The total increase in water demand for the stations and the LMF of approximately 132,500 gpd represents a negligible amount (approximately 0.8 percent) of the remaining water supply. In addition, during a single dry year, the water supply would be equal to 90 percent of the water supply for a normal year, according to the SFPUC (SFPUC 2016). In a single dry year, the remaining water supply would be approximately 14,940,000 gpd.[12] The total increase in water demand for the stations and the LMF of approximately 132,500 gpd would still represents a negligible amount (approximately 0.9 percent) of the remaining water supply during a single dry year. During multiple dry years (2 years and 3 years), the water supply would be equal to 78 percent of the water supply for a normal year (SFPUC 2016). During multiple dry years, the remaining water supply would be approximately 12,948,000 gpd.[13] The total increase in water demand for the stations and the LMF of approximately 132,500 gpd would still represents a negligible amount (approximately 1.0 percent) of the remaining water supply during multiple dry years.

SFPUC approximates that in 2040 the water demand for wholesale customers would be approximately 173,900,000 gpd of water of the 184,000,000-gpd supply (SFPUC 2016). Thus, in 2040, a total of approximately 10,100,000 gpd of the wholesale water supply would still be available. The total increase in water demand for the stations and the LMF of approximately 132,500 gpd represents a negligible amount (approximately 1.3 percent) of the remaining water supply. In addition, during a single dry year, the water supply would be equal to 90 percent of the water supply for a normal year, according to the SFPUC (SFPUC 2016). In a single dry year, the

[12] 14,940,000 = 0.90 * 16,600,000
[13] 12,948,000 = 0.78 * 16,600,000

remaining water supply would be approximately 9,090,000 gpd.[14] The total increase in water demand for the stations and the LMF of approximately 132,500 gpd would still represents a negligible amount (approximately 1.5 percent) of the remaining water supply during a single dry year. During multiple dry years (2 years and 3 years), the water supply would be equal to 78 percent of the water supply for a normal year (SFPUC 2016). During multiple dry years, the remaining water supply would be approximately 7,878,000 gpd.[15] The total increase in water demand for the stations and the LMF of approximately 132,500 gpd would still represents a negligible amount (approximately 1.7 percent) of the remaining water supply during multiple dry years.

Furthermore, operation of the modified stations and LMF would minimize the use of potable water through compliance with the Authority's Water Conservation Guidance (Authority 2015). This guidance includes specific requirements that would minimize the use of potable water, including requiring the use of efficient facilities; using nonpotable water for irrigation, wherever possible; and requiring reusing water from water flushing. Therefore, the demand for potable water during operation could be less than the 132,500 gpd assumed in this analysis.

#### CEQA Conclusion

There would be a less-than-significant impact under CEQA from continuous permanent water use during project operation. Through compliance with the Authority's Water Conservation Guidance requirements (Authority 2015), the Authority would minimize water use during operation. The project would result in a permanent increase in water use; however, this increase would be 0.8 percent of the remaining water supply for a normal year in 2030, 0.9 percent for a single dry year in 2030, and 1.0 percent for multiple dry years in 2030. In 2040, the increase would be 1.3 percent of the remaining water supply for a normal year, 1.5 percent for a single dry year, and 1.7 percent for multiple dry years. Project features would include systems and procedures to reuse water and reduce consumption that would minimize the need for water during operations. Stations and maintenance facilities would use recycled or reclaimed water for nonpotable uses where recycled water is available and where such use is permitted to reduce overall water use and reduce the amount of potable water needed for operation. Therefore, because (1) the project demand represents a minor (between 0.8 and 1.7 percent for normal years, single dry years, and multiple dry years in 2030 and 2040) addition to the remaining water supply and because (2) project features would be implemented to further minimize that minor demand; it is concluded that sufficient water supplies would be available to serve operation of the project and reasonably foreseeable future development during normal, dry, and multiple dry years. Accordingly, the impact on water supplies from operational water use would be less than significant under CEQA. Therefore, CEQA does not require mitigation.

### Impact PUE#9: Continuous Permanent Impacts from Wastewater Generation

A variety of uses, including drinking fountains and restrooms, landscaping irrigation, and station and facility maintenance wash water, would generate wastewater at the 4th and King Street Station, Millbrae Station, San Jose Diridon Station and Brisbane LMF. The amount of wastewater that would be generated would be the same for each of the project alternatives. As shown in Table 3.6-14, water consumption would be increased at the 4th and King Street Station and Millbrae Station by approximately 8,000 gpd; and at San Jose Diridon Station water consumption would be increased by 18,800 gallons. Water consumption at the LMF would be increased by 106,000 gpd. The total increase in operational water use for the project is approximately 132,500 gpd. The amount of wastewater generated from the stations and the LMF is assumed to be 100 percent of the operational water consumption.

The increased amount of wastewater generated by the 4th and King Street Station and the LMF would be served by the SFPUC wastewater infrastructure. The increased amount of wastewater generated (108,000 gpd) from the 4th and King Street Station and the LMF would represent 0.1

[14] 9,090,000 = 0.90 * 10,100,000
[15] 7,878,000 = 0.78 * 10,100,000

percent of the remaining wastewater treatment capacity (81,200,000 gpd) provided by the Southeast Water Quality Control Treatment Facility.

The increased amount of wastewater generated by the Millbrae Station would be served by the City of Millbrae Water Pollution Control Plant, and is estimated to be approximately 6,000 gpd. The wastewater generated from the Millbrae Station would represent 0.5 percent of the remaining wastewater treatment capacity (1,200,000 gpd) provided by the City of Millbrae Water Pollution Control Plant.

The increased amount of wastewater generated by the San Jose Diridon Station would be served by the San Jose-Santa Clara Regional Wastewater Facility (jointly owned by the Cities of Santa Clara and San Jose and operated by the City of San Jose's Environmental Services Department). The increase of 18,800 gpd would represent 0.03 percent of the wastewater treatment facility's capacity (57,000,000 gpd).

#### CEQA Conclusion

There would be a less-than-significant impact under CEQA from continuous permanent wastewater generation during project operations. Wastewater generated at stations and the Brisbane LMF during operations would be discharged to the sewer system and would represent less than 1 percent of the available capacities of local wastewater treatment facilities. Thus, there is adequate capacity at the existing WWTPs to serve the project's projected wastewater treatment demand, in addition to their existing commitments. The construction of new wastewater infrastructure or the expansion of existing facilities would not be required. Furthermore, the WWTPs that would serve the project are required to adhere to RWQCB treatment requirements. The wastewater generated by the project would, therefore, not exceed RWQCB wastewater treatment requirements. The impact from wastewater generated during operation of the project would be less than significant. Therefore, CEQA does not require any mitigation.

### Impact PUE#10: Permanent Impacts on Storm Drainage Facilities

Construction of the project would cause permanent changes in drainage patterns from the excavation and placement of fill, widening of existing embankments, and new impervious surfaces. These changes would affect stormwater runoff during rain events, including changes in runoff volume and rates and increased pollutant loading, compared to existing conditions. The design of the project would include on-site stormwater management facilities, which would capture runoff and provide treatment prior to discharge (HYD-IAMF#1). The on-site storm drainage system would consist of open ditches or subsurface drains placed at the outer sides of the railbed. An open ditch is a natural or built structure that conveys water with the top surface in contact with the atmosphere. Subsurface drainage systems are necessary to rapidly remove and prevent water from interfering with track stability, roadbeds, and side slopes, or where right-of-way constrains the use of open ditches. The runoff generated on-site would be discharged into this drainage system of open ditches or subsurface drains. Water from the open ditches and under drains would either enter the local storm drain system or directly enter into a nearby creek or waterbody, similar to existing conditions. Conceptual drainage was evaluated, and adequate right-of-way is available for drainage and detention. Permanent impacts on drainage patterns and stormwater runoff are discussed Section 3.8 under Impact HYD#2.

Construction of new infrastructure would be designed to prevent saturation, increase infiltration, and stabilize soils where streamflow velocities are increased to minimize potential impacts related to erosion and surface water hydrology (HYD-IAMF#2). Stormwater management practices and measures as well as permeable surfaces to retain or detain and treat stormwater on-site would also be incorporated into the design of the project (HYD-IAMF#3). In addition, stormwater runoff would be effectively managed and treated through the installation of infiltration or detention facilities and incorporation of permeable vegetated surfaces to accommodate increased rates and amount of runoff, and to increase infiltration and groundwater recharge (HYD-IAMF#4). The Authority would also implement additional flow control measures where local regulations or drainage requirements dictate. Section 3.8 provides further detailed analysis regarding potential impacts on drainage and stormwater runoff.

#### CEQA Conclusion

The impact on stormwater drainage facilities would be less than significant under CEQA because the project would not require or result in the relocation or construction of new or expanded stormwater drainage facilities. Permanent impacts on drainage patterns and stormwater runoff are described in Section 3.8 under Impact HYD#2. Project features would include effective measures to manage and treat stormwater through the installation of infiltration or detention facilities and incorporation of permeable vegetated surfaces to accommodate increased rates and amount of runoff, and to increase infiltration and groundwater recharge. Thus, operation of the project would not require or result in the need for new or expanded storm drainage facilities beyond those that would be built within the project footprint as part of the project analyzed throughout this Draft EIR/EIS. The impact under CEQA would be less than significant. Therefore, CEQA does not require any mitigation.

### Impact PUE#11: Continuous Permanent Generation of Solid Waste and Hazardous Waste

Operation of the 4th and King Street Station, Millbrae Station, San Jose Diridon Station, and Brisbane LMF would generate solid waste including product packaging, broken equipment, passenger refuse disposal, and site litter. Operation activities that would generate hazardous solid waste include maintenance of HSR facilities and guideway.

Alternatives A and B would generate the same amount of solid waste at the 4th and King Street Station, Millbrae Station, San Jose Diridon Station, and Brisbane LMF. Table 3.6-15 shows the additional solid waste that would be generated at the 4th and King Street Station, Millbrae Station, San Jose Diridon Station, and Brisbane LMF, which is approximately 680 tons per year, which is equivalent to approximately 3,092 cubic yards per year. The solid waste from the 4th and King Street Station, Millbrae Station, and LMF would likely be sent to the Corinda Los Trancos Landfill (Ox Mountain Sanitary), which is in San Mateo County. As shown in Table 3.6-5, the remaining capacity of this facility is 22,180,000 cubic yards and the permitted disposal capacity is approximately 3,598 tons per day. The annual generation of approximately 2,628 cubic yards of additional solid waste from the 4th and King Street Station, Millbrae Station, and LMF would represent approximately 0.01 percent of remaining disposal capacity in the Corinda Los Trancos Landfill (Ox Mountain Sanitary). The solid waste from the San Jose Diridon Station would likely be sent to landfills in Santa Clara County. The remaining capacity of municipal solid waste landfills in Santa Clara County is approximately 50 million cubic yards, and permitted disposal capacity is approximately 7,900 tons per day. The annual generation of 464 cubic yards of solid waste from the San Jose Diridon Station would represent approximately 0.001 percent of remaining permitted solid waste disposal capacity in Santa Clara County. The solid waste landfills within the RSA are licensed for decades of operation. The closure dates for solid waste landfills within the RSA range from 2021 to 2118 and the facilities collectively have approximately 290 million cubic yards of remaining disposal capacity (see Table 3.6-5). County and municipal government planning processes would anticipate the need for replacement of solid waste disposal capacity as the licensed operation periods of these facilities approach their conclusion; therefore, no shortage of disposal capacity is expected over the operating life of the HSR facilities. Additionally, the amount of solid waste disposed of in landfills would be reduced through the Authority’s adherence to the solid waste diversion requirements, including that of AB 75, which requires state agencies to divert at least 50 percent of solid waste from landfill disposal.

**Table 3.6-15 Operational Generation of Solid Waste**

| Project Component | Existing Solid Waste Generation | | Additional Solid Waste Generation due to Project | | Operational Solid Waste Generation | |
|---|---|---|---|---|---|---|
| | Tons per year | Cubic yards per year [1] | Tons per year | Cubic yards per year [1] | Tons per year | Cubic yards per year [1] |
| 4th and King Street Station | 21 | 96 | 10 | 46 | 31 | 141 |
| Millbrae Station | 38 | 172 | 30 | 136 | 68 | 310 |
| Brisbane LMF | 0 | 0 | 538 | 2,446 | 538 | 2,450 |
| San Jose Diridon Station | 28 | 127 | 102 | 464 | 130 | 591 |
| **Total** | **87** | **395** | **680** | **3,092** | **767** | **3,492** |

LMF = light maintenance facility
[1] The volume of solid waste (in cubic yards) was estimated by using the conversion rate of 0.22 tons per 1 cubic yard. The conversion rate is for un-compacted mixed solid waste (CalRecycle n.d.).

Operation of the 4th and King Street Station, Millbrae Station, San Jose Diridon Station, and LMF would involve the use, storage, and disposal of hazardous materials associated with maintenance of HSR equipment. Hazardous waste may consist of welding materials, fuel and lubricant containers, batteries, and paint and solvent residues and containers. All hazardous wastes would be handled, stored, transported, and disposed of in accordance with RCRA requirements (HMW-IAMF#7, HMW-IAMF#10). A certified hazardous waste collection company would transport the waste to an authorized hazardous waste management facility for recycling or disposal.

Hazardous waste landfills in California have adequate capacity to dispose of hazardous waste generated from operation of the 4th and King Street Station, Millbrae Station, San Jose Diridon Station, and LMF. The Authority anticipates that the amount of hazardous waste generated from operation of the stations and the LMF would be less than the amount of nonhazardous solid waste generated from these facilities. The total amount of increased hazardous waste generated from the stations and the LMF is assumed not to exceed 3,092 cubic yards per year (680 tons per year) based on the amount of nonhazardous solid waste generated.

The Kettleman Hills hazardous waste disposal facility in Kings County, California has a remaining disposal capacity of approximately 4.9 million cubic yards based on the DTSC approval of a permitted expansion in 2014 (DTSC 2018). The Clean Harbors Buttonwillow Facility has a permitted hazardous waste disposal capacity of 13.25 million cubic yards and an estimated closure date of 2040 (CalRecycle 2014b). Clean Harbors reported a permitted disposal capacity in excess of 10 million cubic yards for the Buttonwillow landfill (Clean Harbors n.d.(a)). The Clean Harbors Westmorland Facility has a design capacity of 5 million cubic yards and an annual receiving capacity of 440,000 cubic yards (Clean Harbors n.d.(b)). The estimated generation of 3,092 additional cubic yards of hazardous waste from the stations and the LMF represents approximately 0.02 percent of the estimated 14.9 million cubic yards of available hazardous waste landfill capacity for the three landfills. Therefore, hazardous waste landfill capacity is adequate for the anticipated hazardous waste generation for the operation of each project alternative.

#### CEQA Conclusion

There would be a less-than-significant impact under CEQA from continuous permanent solid waste generation during project operations and a less than significant impact from continuous permanent hazardous waste generation during project operations. Operation of the project would not generate solid waste in excess of state or local standards or in excess of the capacity of local infrastructure, and would not impair the attainment of state or local solid waste reduction goals.

There would be a less-than-significant impact under CEQA from nonhazardous solid and hazardous waste generation during operations and maintenance (O&M) activities for both alternatives because solid nonhazardous and hazardous waste generated during these O&M

activities would not exceed the capacity of permitted solid waste landfills in the RSA and would not exceed the permitted capacity of hazardous waste landfills in California. No new solid waste disposal infrastructure and no new hazardous waste disposal infrastructure would need to be built and permitted as result of the project, and solid waste generation from project operation would not impair the attainment of solid waste reduction goals. Solid waste would be disposed of in accordance with solid waste landfill permit requirements and hazardous waste would be disposed of in a manner consistent with RCRA regulations (HMW-IAMF#7, HMW-IAMF#10).

As part of project operations, the Authority would comply with regulations that control the transport, use, storage, and disposal of hazardous materials and hazardous wastes generated during operation. The Authority would implement a written hazardous materials and hazardous waste management plan that would describe responsible parties and procedures for hazardous waste transport, containment, storage, and disposal, as well as hazardous material and hazardous waste management BMPs and monitor regulatory compliance of operations (HMW-IAMF#7, HMW-IAMF#10). Through proper disposal at landfills and the safe handling and management of solid and hazardous wastes, the project would minimize impacts from the continuous permanent generation of nonhazardous solid waste and hazardous waste. Therefore, CEQA does not require mitigation.

### *3.6.6.3 Energy*

Construction of the project would result in temporary and permanent impacts on energy resources, including electricity, natural gas, and petroleum products. Construction of the project alternatives would consume energy for demolition of existing structures; clearing and grubbing; handling, storing, hauling, excavating, and placing fill; and construction and modification of bridges, road modifications, and utility relocations. Operation of the project would consume energy for operation of the HSR trains, stations, and the LMF.

**No Project Impacts**

The population in San Francisco, San Mateo, and Santa Clara Counties is projected to grow through 2040, as discussed in Chapter 2. Demand for energy would increase at a level commensurate with population growth. The region would increase peak and base period electricity demand and would require additional generation and transmission capacity. According to the CEC, the average annual growth rate for statewide base electricity demand between 2017 and 2027 is forecasted to increase between 0.7 percent (low energy demand) and 1.4 percent (high energy demand) (CEC 2017b). The CEC analysis included forecasted impacts of approved efficiency programs, climate change, electric vehicles, other electrification (including ports and HSR), and demand response (time of use pricing) programs. Energy use in San Francisco, San Mateo, and Santa Clara Counties would be anticipated to trend along the forecasted state average during this same time period.

Without the HSR project, the forecasted population growth would increase pressure to expand highway and airport capacities. The Authority estimates that additional highway and airport projects (up to 4,300 highway lane miles and 115 airport gates, and 4 airport runways) would be needed to achieve equivalent capacity and relieve the increased pressure (Authority 2012). This expansion of airports and highways would increase VMT and airline flights and increase the demand for energy resources including electricity, natural gas, and petroleum fuels. Under the No Project Alternative, the beneficial effect of reductions in statewide energy consumption related to reductions in VMT and reductions in airline flights from operation of the HSR would not occur.

Under the No Project Alternative, recent development trends are anticipated to continue, leading to impacts on energy. Impacts would include the conversion of existing land to residential, commercial, industrial, and transportation infrastructure to accommodate future growth, placing potential pressures on energy resources. Increased electricity demand would be provided by fossil fuel and renewable electricity sources in California and in other states. Under California SB X1-2 (2011) retail sellers of electricity in California will be required to serve 33 percent of their electricity load with renewable energy by December 31, 2020. Planned development and transportation projects that would occur under the No Project Alternative would likely include various forms of mitigation to address impacts on energy.

**Project Impacts**

***Construction Impacts***

Construction of the project would include demolition of existing structures; clearing and grubbing; handling, storing, hauling, excavating, and placing fill; and construction and modification of bridges, road modifications, and utility relocations. Construction activities would involve operation of vehicles for transporting materials, equipment and workers, operation of excavators, graders, and other earthmoving equipment for construction in the right-of-way, operation of cranes and other overhead equipment for demolition of buildings and structures and construction in the right-of-way, and operation of portable generators, pumps, and other construction equipment that would consume petroleum fuels. Construction activities would also include providing lighting for construction work areas and operation of equipment that would consume electricity. Chapter 2 describes construction activities in more detail.

**Impact PUE#12: Temporary Consumption of Energy during Construction**

Construction of the project would require consumption of petroleum fuels temporarily during the construction period for operation of vehicles to transport materials, equipment, and workers, and operation of earthmoving equipment, cranes, and other overhead construction equipment. Gasoline and diesel would be the main source of energy that would be used during construction of the project. Minimal electricity would be required for lighting.

Table 3.6-16 shows a comparison of the project alternatives, which shows the estimated energy consumption for construction of the project alternatives between 2021 and 2026. The energy consumption estimate for constructing the project alternatives is 9,977 billion Btu for Alternative A, 10,911 billion Btu for Alternative B (Viaduct to I-880), and 10,778 billion Btu for Alternative B (Viaduct to Scott Boulevard).

**Table 3.6-16 Estimated Nonrecoverable Construction-Related Energy Consumption for the Project Alternatives**

| Year | Gallons per year | | Energy Consumption (billion Btu per year) |
|---|---|---|---|
| | Gasoline | Diesel | |
| **Alternative A** | | | |
| 2021 | 810,187 | 6,272,766 | 959 |
| 2022 | 1,855,072 | 13,994,266 | 2,146 |
| 2023 | 1,885,853 | 14,902,426 | 2,275 |
| 2024 | 1,991,284 | 15,320,283 | 2,345 |
| 2025 | 1,674,249 | 14,922,331 | 2,252 |
| 2026 | 1,073 | 7,352 | 1 |
| 2027 | 0 | 0 | 0 |
| 2028 | 0 | 0 | 0 |
| **Total** | **8,217,717** | **65,419,425** | **9,977** |

| Year | Gallons per year | | Energy Consumption (billion Btu per year) |
|---|---|---|---|
| | Gasoline | Diesel | |
| **Alternative B[1]** | | | |
| 2021 | 931,379 | 6,365,763 | 987 |
| 2022 | 2,340,070 | 14,465,431 | 2,269 |
| 2023 | 2,383,274/ 2,452,138 | 15,209,878/ 15,550,776 | 2,377/ 2,432 |
| 2024 | 2,433,316/ 2,554,911 | 17,816,003 17,659,250 | 2,741/ 2,734 |
| 2025 | 1,894,880/ 1,794,742 | 16,797,766/ 15,578,305 | 2,536/ 2,356 |
| 2026 | 1,391/0 | 11,219/0 | 2/0 |
| 2027 | 0 | 0 | 0 |
| 2028 | 0 | 0 | 0 |
| **Total** | **9,984,311/ 10,073,241** | **70,666,061/ 69,619,526** | **10,911/ 10,778** |

*Source: Authority 2019a*
Btu = British thermal units
I- = Interstate
Table values may not sum to totals because of rounding.
[1] Where applicable, values are presented for Alternative B (Viaduct to I-880) first, followed by Alternative B (Viaduct to Scott Boulevard). If only one value is presented, the value would be identical under both Alternative B viaduct options.

Total gasoline demand for construction of the project alternatives would be approximately 8.2 million gallons for Alternative A,10.0 million gallons for Alternative B (Viaduct to I-880), and 10.1 million gallons per year for Alternative B (Viaduct to Scott Boulevard). These estimates reflect implementation of the Authority's Sustainability Policy (Authority 2016a) and implementation of specific sustainability requirements included by the Authority in the contract for design-build services (PUE-IAMF#1). In 2017, sales of gasoline to end users in California were approximately 4,369,600 gpd (EIA 2018i). At the peak of construction activity in 2024, gasoline consumption for construction of Alternative A would be 2.0 million gallons per year (equivalent to 5,455 gpd); gasoline consumption for construction of Alternative B (Viaduct to I-880) would be 2.4 million gallons per year (equivalent to 6,667 gpd); gasoline consumption for construction of Alternative B (Viaduct to Scott Boulevard) would be 2.5 million gallons per year (equivalent to 7,000 gpd). Therefore, at the peak of construction, construction-related gasoline consumption would represent 0.1 percent of statewide gasoline consumption under both project alternatives.

Total diesel fuel demand for construction of the project alternatives would be approximately 65.4 million gallons for Alternative A, 70.7 million gallons for Alternative B (Viaduct to I-880), and 69.6 million gallons for Alternative B (Viaduct to Scott Boulevard) over the 2021–2026 construction period. These values reflect implementation of the Authority's Sustainability Policy and implementation of specific sustainability requirements included by the Authority in the contract for design-build services (PUE-IAMF#1). In 2017 sales of diesel fuel to end users in California were approximately 1,214,300 gpd (EIA 2018j). At the peak of construction activity in 2024, diesel fuel consumption for construction of Alternative A would be 15.3 million gallons per year (equivalent to 41,970 gpd); diesel fuel consumption for construction of Alternative B (Viaduct to I-880) would be 17.8 million gallons per year (equivalent to 48,810 gpd); diesel fuel consumption for construction of Alternative B (Viaduct to Scott Boulevard) would be 17.7 million gallons per year (equivalent to 48,380 gpd). Therefore, at the peak of construction, construction-related diesel consumption would represent approximately 4 percent of statewide diesel consumption under either project alternative.

The use of electricity during construction would be limited to lighting, which would be generated from portable generators. The fuel that would be used for the portable generators has been accounted for in the estimates of fuels that would be required during construction, as summarized in Table 3.6-16. Thus, the amount of grid-supplied electricity that would be used during construction would be negligible and would represent an insignificant amount of statewide electricity consumptions, including electricity consumption during peak periods. As a result, construction of the project alternatives would not result in the need for construction of new electric generating capacity.

**CEQA Conclusion**

There would be a less-than-significant impact under CEQA on electric energy resources from both of the project alternatives because energy consumption during project construction would not place a substantial demand on regional energy supply, require construction of substantial additional electric generating capacity, or substantially increase peak- or base-period electricity demand. Construction of the project would not result in potentially significant environmental impacts due to wasteful, inefficient, or unnecessary consumption of energy resources or conflict with or obstruct a state or local plan for renewable energy or energy efficiency. Due to the minimal amount of grid-supplied electricity that would be used during construction, no new electric generating capacity would need to be built to supply electricity to meet peak demand for electricity during project construction. Construction energy consumption would not require additional petroleum fuel production or distribution capacity to supply gasoline or diesel fuel. The project features would minimize construction energy consumption through implementation of the Authority's Sustainability Policy and implementation of specific sustainability requirements included by the Authority in the contract for design-build services (PUE-IAMF#1). Therefore, CEQA does not require mitigation.

### *Operations Impacts*

Operation of the project would involve scheduled train travel along the HSR alignment, positive train control, communications and inspection and maintenance along the track and railroad right-of-way, and at stations, structures, fencing and, power systems. Chapter 2 describes O&M activities in more detail.

#### Impact PUE#13: Continuous Permanent Impacts from Energy Consumption during Operations

Operation of the 4th and King Street Station, Millbrae Station, San Jose Diridon Station, and Brisbane LMF would require the use of natural gas and electricity. Table 3.6-17 shows the increased demand on electricity and natural gas that would be required for operation of the 4th and King Street Station, Millbrae Station, San Jose Diridon Station, and LMF. The natural gas and electricity demand would be the same for Alternative A and Alternative B (both viaduct options); thus, the information shown in Table 3.6-17 applies to all alternatives. The project would overall increase the demand for energy use by approximately 61,675 MMBtu per year.

**Table 3.6-17 Operational Electricity and Natural Gas Use**

| Project Component | Electricity Use (kWh/year) | | | Natural Gas Use (therms/year) | | | Total Additional Energy Use (MMBtu/ year) |
|---|---|---|---|---|---|---|---|
| | Existing Use | Operational Use | Additional Use | Existing Use | Operational Use | Additional Use | |
| 4th and King Street Station | 476,000 | 711,200 | 235,200 | 850 | 1,270 | 420 | 2,553 |
| Millbrae Station | 863,520 | 1,546,020 | 682,500 | 1,542 | 2,761 | 1,219 | 5,551 |
| East or West Brisbane LMF | 0 | 12,141,360 | 12,141,360 | 0 | 21,681 | 21,681 | 43,596 |
| San Jose Diridon Station | 623,763 | 2,789,138 | 2,165,375 | 1,022 | 4,570 | 3,548 | 9,974 |
| **Total** | 1,963,283 | 17,187,718 | 15,224,435 | 3,414 | 30,282 | 26,868 | 61,675 |

kWh = kilowatt hours
MMBtu = million British thermal units
Actual project consumption would be lower since stations would be LEED platinum.

*Medium and High Ridership Scenarios*

The medium ridership and high ridership forecasts reflect the uncertainty of the ultimate ridership of the HSR system, which is dependent on many factors, such as the future price of gasoline and population growth. The Authority evaluated two ridership scenarios to reflect a range of expected ridership expected over the coming decades.

Operation of the project alternatives would use electrified OCS to supply electric vehicles with traction power connected to existing PG&E substations (see Chapter 2). For determining HSR energy consumption due to train operations, the Authority assumed use of a Siemens ICE-3 Velaro vehicle operating as two 8-car trainsets and traveling 43.1 million annual train miles by 2040. Table 3.6-7 shows the existing 2015 electricity consumption for the three-county region and the state and Table 3.6-18 shows the electricity consumption for HSR operation of the two ridership scenarios—medium and high ridership—in 2029 and 2040. Energy consumption for project operation in 2029 is estimated to be 80,340 MMBtu per year under the medium ridership scenario and 88,370 MMBtu under the high ridership scenario for the project alternatives. This represents between 0.008 and 0.009 percent of the 2015 statewide electricity consumption. Energy consumption for 2040 is estimated to be 94,090 MMBtu per year under the medium ridership scenario and 103,500 MMBtu per year under the high ridership scenario for the project alternatives, which represents between 0.010 and 0.011 percent of the 2015 statewide electricity consumption.

**Table 3.6-18 HSR Operational Electricity Consumption (Medium and High Ridership Scenarios)[1]**

| County/Region | HSR Operational Electricity Consumption (MMBtu/year) | |
|---|---|---|
| | 2029 | 2040 |
| **Medium Ridership Scenario** | | |
| San Francisco, San Mateo, and Santa Clara Counties | 80,340 | 94,090 |
| Statewide | 1,338,940 | 1,568,140 |
| **High Ridership Scenario** | | |
| San Francisco, San Mateo, and Santa Clara Counties | 88,370 | 103,500 |
| Statewide | 1,472,840 | 1,724,950 |

*Source: Authority 2019d*
MMBtu = million British thermal units
[1] This table summarizes energy consumption for operation of the HSR trains, stations, and maintenance facilities.

The project would incorporate design elements that minimize electricity consumption (e.g., using regenerative braking, energy-saving equipment on HSR trains and at station and maintenance facilities, and automatic train operations to maximize energy efficiency during operations), such that operations would not overburden utility services (PUE-IAMF#1). The design elements would be included in the design-build contract. Additionally, the Authority has adopted a sustainability policy that establishes project design requirements that avoid and minimize energy consumption during operations.

The HSR system, including the project, would obtain power from California's electricity grid. The HSR system is expected to require less than 1 percent of the state's future electricity consumption. In 2008, a study performed by Navigant Consulting, Inc. for the Authority found that because the HSR would be supplied with energy from the California grid, it is not feasible to physically control the flow of electricity from particular sources (Authority 2008). However, it would be feasible for the Authority to obtain the quantity of power required for the HSR from 100 percent clean, renewable energy sources through a variety of mechanisms, such as paying a clean-energy premium for consumed electricity. An industry survey in April 2013 indicated that there is sufficient renewable energy capacity to meet the system demand (Authority and FRA 2017). Under the 2013 Policy Directive Poli-Plan-03, the Authority has adopted a goal to purchase 100 percent of the HSR system's power from renewable energy sources (Authority 2016a).

The HSR system would decrease automobile VMT and reduce energy consumption by automobiles, resulting in an overall reduction in energy use for intercity and commuter travel. Table 3.6-19 shows the change in estimated daily VMT and associated energy consumption with and without the HSR system for the medium and high ridership scenarios for 2029 and 2040. HSR operation would reduce daily VMT in San Francisco, San Mateo, and Santa Clara Counties by 183 to 246 million VMT per year in 2029 for the medium and high ridership scenarios, and by 345 to 462 million VMT per year in 2040 for the medium and high ridership scenarios. These values, together with associated average daily speed estimates, were used to develop predictions of the change in energy use associated with VMT for the three counties. The reduction in energy use from the VMT reduction in San Francisco, San Mateo, and Santa Clara Counties in 2029 ranges from 595,930 to 800,400 MMBtu per year under the medium and high ridership scenarios. The reduction in energy use from the VMT reduction in San Francisco, San Mateo, and Santa Clara Counties in 2040 ranges from 1,002,990 to 1,139,160 MMBtu per year for the project alternatives under the medium and high ridership scenarios.

**Table 3.6-19 Estimated Changes in Vehicle Miles Traveled and Energy Consumption (Medium and High Ridership Scenarios)[1 2]**

| County/Region | Existing Conditions (2015) | | Future Conditions (2029) | | Future Conditions (2040) | |
|---|---|---|---|---|---|---|
| | VMT | Energy Consumption (MMBtu/year) | Change in VMT between 2029 Plus Project and 2029 No Project | Change in Energy Consumption between 2029 Plus Project and 2029 No Project (MMBtu/year) | Change in VMT between 2040 Plus Project and 2040 No Project | Change in Energy Consumption between 2040 Plus Project and 2040 No Project (MMBtu/year) |
| **Medium Ridership Scenario** | | | | | | |
| San Francisco County | 2,394,634,890 | 15,777,220 | -10,980,510 | -48,270 | -24,406,720 | -94,210 |
| San Mateo County | 4,177,229,010 | 19,803,650 | -41,119,590 | -129,570 | -90,286,270 | -253,640 |
| Santa Clara County | 10,312,374,120 | 49,592,630 | -130,784,260 | -418,090 | -229,877,270 | -655,140 |
| **Region** | **16,884,238,020** | **85,173,500** | **-182,884,360** | **-595,930** | **-344,570,260** | **-1,002,990** |
| **Statewide** | **205,015,920,150** | **930,015,060** | **-2,266,597,310** | **-6,782,860** | **-4,768,401,550** | **-7,487,640** |
| **High Ridership Scenario** | | | | | | |
| San Francisco County | 2,389,767,860 | 15,745,150 | -14,230,730 | -62,560 | -31,507,070 | -121,620 |
| San Mateo County | 4,166,580,970 | 19,753,170 | -55,621,590 | -175,270 | -119,579,780 | -131,580 |
| Santa Clara County | 10,283,778,970 | 49,455,110 | -175,990,310 | -562,610 | -310,866,450 | -885,960 |
| **Region** | **16,840,127,800** | **84,953,430** | **-245,842,630** | **-800,440** | **-461,953,300** | **-1,139,160** |
| **Statewide** | **203,997,417,630** | **925,394,820** | **-3,137,576,250** | **-4,067,685** | **-6,555,992,320** | **-16,978,030** |

*Source: Authority 2019d*
MMBtu = million British thermal units
VMT = vehicle miles traveled
Table values may not sum to totals on account of rounding
[1] This table summarizes energy consumption for operation of the HSR trains, stations, and maintenance facilities.
[2] The Authority developed the two scenarios (medium ridership and high ridership) for three different years: 2015 Existing Conditions, 2029 Plus Project conditions (opening), and 2040 Plus Project conditions (Phase 1 of the HSR system horizon 2040). Both scenarios are based on the level of ridership as presented in *Connecting and Transforming California, 2016 Business Plan* (Authority 2016b). These scenarios assume different background conditions. For example, forecast trends in demographics and travel costs can influence ridership for any HSR scenario. The medium scenario was developed using the "most likely" values of all inputs to the HSR ridership forecasting model, while the high scenario used inputs that were set at values that result in ridership at the 75th percentile of the range considered in the ridership risk analysis. The 2016 Business Plan provides additional detail on the travel forecasts and risk analysis.

In addition, the number of airplane flights statewide (intrastate) would decrease with implementation of the HSR system when analyzed against the future No Project and existing conditions because some travelers would choose to use the HSR rather than fly to their destination. Table 3.6-20 shows the reduction in the number of airplane flights associated with the project alternatives for the medium and high ridership scenarios.

**Table 3.6-20 Estimated Changes in Airplane Flights and Energy Consumption (Medium and High Ridership Scenarios)[1, 2]**

| | Existing Conditions (2015) | | Future Conditions (2029) | | Future Conditions (2040) | |
|---|---|---|---|---|---|---|
| Region | Flights | Energy Consumption (MMBtu/year) | Change in Flights between 2029 Plus Project and 2029 No Project | Change in Energy Consumption between 2029 Plus Project and 2029 No Project (MMBtu/year) | Change in Flights between 2040 Plus Project and 2040 No Project | Change in Energy Consumption between 2040 Plus Project and 2040 No Project (MMBtu/year) |
| **Medium Ridership Scenario** | | | | | | |
| Bay Area | 91,120 | 10,932,600 | -20,660 | -2,478,640 | -44,000 | -5,279,340 |
| Statewide | 268,570 | 32,221,210 | -52,140 | -6,255,290 | -111,370 | -13,362,110 |
| **High Ridership Scenario** | | | | | | |
| Bay Area | 85,060 | 10,205,660 | -22,640 | -2,716,740 | -42,120 | -5,052,810 |
| Statewide | 250,280 | 30,026,780 | -57,640 | -6,915,450 | -107,150 | -12,855,700 |

*Source: Authority 2019d*

MMBtu = million British thermal units

[1] This table summarizes energy consumption for operation of the HSR trains, stations, and maintenance facilities.

[2] The Authority developed the two scenarios (medium ridership and high ridership) for three different years: 2015 Existing Conditions, 2029 Plus Project conditions (opening), and 2040 Plus Project conditions (Phase 1 of the HSR system horizon 2040). Both scenarios are based on the level of ridership as presented in *Connecting and Transforming California, 2016 Business Plan* (Authority 2016b). These scenarios assume different background conditions. For example, forecast trends in demographics and travel costs can influence ridership for any HSR scenario. The medium scenario was developed using the “most likely” values of all inputs to the HSR ridership forecasting model, while the high scenario used inputs that were set at values that result in ridership at the 75th percentile of the range considered in the ridership risk analysis. The 2016 Business Plan provides additional detail on the travel forecasts and risk analysis.

The Authority estimated the number of air trips removed as a result of the HSR system by using the travel demand modeling analysis conducted for the project. The average full flight cycle fuel consumption rate for aircraft was based on the profile of aircraft currently servicing the San Francisco to Los Angeles airline corridor. Operation under the medium ridership scenario would reduce energy consumption from airplane flights by 2,478,640 MMBtu per year for the Bay Area and by 6,255,290 MMBtu per year statewide in 2029. Operation under the high ridership scenario would reduce energy consumption from airplane flights by 2,716,740 MMBtu per year for the Bay Area and by 6,915,450 MMBtu per year statewide in 2029. Operation under the medium ridership scenario would reduce energy consumption from airplane flights by 5,279,340 MMBtu per year for the Bay Area and by 13,362,110 MMBtu per year statewide in 2040. Operation under the high ridership scenario would reduce energy consumption from airplane flights by 5,052,810 MMBtu per year for the Bay Area and by 12,855,700 MMBtu per year statewide in 2040.

Table 3.6-21 and Table 3.6-22 shows a summary of energy consumption for project operation, as well as the resulting regional and statewide changes in energy consumption from the reduction in VMT and airplane flights that would occur as a result of operation of the HSR for 2029 and 2040. Operation of the project in 2029 would reduce regional energy consumption by 2,994,230 MMBtu per year under the medium ridership scenario and by 3,428,810 MMBtu per year under the high ridership scenario. Operation of the project in 2029 would reduce statewide energy consumption by 11,699,210 MMBtu per year under the medium ridership scenario and by 9,510,310 MMBtu per year under the high ridership scenario. Operation of the project in 2040 would reduce regional energy consumption by 6,188,240 MMBtu per year under the medium ridership scenario and by 6,088,470 MMBtu per year under the high ridership scenario. Operation of the project in 2040 would reduce statewide energy consumption by 19,281,610 MMBtu per year under the medium ridership scenario and by 28,108,780 MMBtu per year under the high ridership scenario.

Construction of the project alternatives would consume energy including electricity and fuels. As shown in Table 3.6-21 and Table 3.6-22, construction of the project alternatives would consume 9,977,000 MMBtu for Alternative A, 10,911,000 MMBtu for Alternative B (Viaduct to I-880), and 10,778,000 MMBtu for Alternative B (Viaduct to Scott Boulevard). The energy consumed during construction would be offset by the savings in energy consumption, from the reduction in VMT and flights. It would take approximately 3 years of regional energy reductions to recoup the energy consumed during construction of the project alternatives and approximately 1 year of statewide energy reductions to recoup the energy consumed during construction of the project alternatives.

Operation of the project would not require construction of significant additional electrical generation capacity nor would operation significantly increase peak- or base-period demands for electricity. The project would increase electricity demand, because of the anticipated times of peak rail travel, impacts on electricity generation and transmission facilities would be particularly focused on peak electricity demand periods (4:00 p.m. to 6:00 p.m.). According to the *Final Program Environmental Impact Report/Environmental Impact Statement (EIR/EIS) for the Proposed California High-Speed Train System* (Authority and FRA 2005), the HSR would increase peak electricity demand on the state's generation and transmission infrastructure by an estimated 480 MW. Based on the assumption that this peak demand would be evenly spread throughout the system, the project (9 percent of total system) would require approximately 43 MW of additional peak capacity, and the project would result in approximately 3.2 MW base electricity demand (94,090 MMBtu per year) for the medium ridership scenario and approximately 3.5 MW base electricity demand (103,500 MMBtu per year) for the high ridership scenario. Although electricity supply in 2040 cannot be predicted, given the planning period available and the known demand from the project, energy providers have sufficient information to include the HSR in their demand forecasts. Cal-ISO has projected growth in electricity demand through 2040 in planning documents and projects the need for an additional 86,000 MW of peak summer capacity between 2017 and 2040 to meet the projected 2040 demand with an adequate reserve margin (Cal-ISO 2015). The Authority expects that the planned additions in capacity projected by Cal-ISO would be met by electricity providers and that available capacity in 2040 would therefore be sufficient to supply electricity for project operations. Based on the projected increase in electricity demand and projected addition of capacity, electricity consumption for project operations would represent approximately 0.1 percent of energy demand in San Francisco, San Mateo, and Santa Clara Counties in 2040 (Table 3.6-18).

Project operation would not require construction of appreciable additional capacity to supply fuel. The project would minimize operation energy consumption by adopting and incorporating in the HSR project features that would minimize electricity consumption (e.g., using regenerative braking, energy-saving equipment on HSR trains and at station facilities, and implementing automatic control of train operations to maximize energy efficiency during operations).

**Table 3.6-21 Summary of Regional Changes in Energy Consumption (Medium and High Ridership Scenarios)[1]**

| Construction Energy Consumption (MMBtu) | |
|---|---|
| Alt A | Alt B[2] |
| 9,977,000 | 10,911,000/ 10,778,000 |

| Project Operation Energy Consumption (MMBtu/year) | | Change in Energy Consumption from Reduced VMT (MMBtu/year) | | Change in Energy Consumption from Reduced Airline Flights (MMBtu/year) | | Total Reduction in Energy Consumption (MMBtu/year) | | Payback Period (years) (2029) | |
|---|---|---|---|---|---|---|---|---|---|
| 2029 | 2040 | 2029 | 2040 | 2029 | 2040 | 2029 | 2040 | Alt A | Alt B |
| **Medium Ridership Scenario** | | | | | | | | | |
| 80,340 | 94,090 | -595,930 | -1,002,990 | -2,478,640 | -5,279,340 | -2,994,230 | -6,188,240 | 3.3 | 3.6 |
| **High Ridership Scenario** | | | | | | | | | |
| 88,370 | 103,500 | -800,440 | -1,139,160 | -2,716,740 | -5,052,810 | -3,428,810 | -6,088,470 | 2.9 | 3.2/ 3.1 |

*Source: Authority 2019c, 2019d*
I- = Interstate
MMBtu = million British thermal units
VMT = vehicle miles traveled
[1] The Authority developed the two scenarios (medium ridership and high ridership) for three different years: 2015 Existing Conditions, 2029 Plus Project conditions (opening), and 2040 Plus Project conditions (Phase 1 of the HSR system horizon 2040). Both scenarios are based on the level of ridership as presented in *Connecting and Transforming California, 2016 Business Plan* (Authority 2016b). These scenarios assume different background conditions. For example, forecast trends in demographics and travel costs can influence ridership for any HSR scenario. The medium scenario was developed using the “most likely” values of all inputs to the HSR ridership forecasting model, while the high scenario used inputs that were set at values that result in ridership at the 75th percentile of the range considered in the ridership risk analysis. The 2016 Business Plan provides additional detail on the travel forecasts and risk analysis.
[2] Where applicable, values are presented for Alternative B (Viaduct to I-880) first, followed by Alternative B (Viaduct to Scott Boulevard). If only one value is presented, the value would be identical under both Alternative B viaduct options.

**Table 3.6-22 Summary of Statewide Changes in Energy Consumption (Medium and High Ridership Scenarios)[1]**

| Construction Energy Consumption (MMBtu) | |
|---|---|
| Alt A | Alt B[2] |
| 9,977,000 | 10,911,000/ 10,778,000 |

| Project Operation Energy Consumption (MMBtu/year) | | Change in Energy Consumption from Reduced VMT (MMBtu/year) | | Change in Energy Consumption from Reduced Airline Flights (MMBtu/year) | | Total Reduction in Energy Consumption (MMBtu/year) | | Payback Period (years) (2029) | |
|---|---|---|---|---|---|---|---|---|---|
| 2029 | 2040 | 2029 | 2040 | 2029 | 2040 | 2029 | 2040 | Alt A | Alt B[2] |
| **Medium Ridership Scenario** | | | | | | | | | |
| 1,338,940 | 1,568,140 | -6,782,860 | -7,487,640 | -6,255,290 | -13,362,110 | -11,699,210 | -19,281,610 | 0.85 | 0.93/ 0.92 |
| **High Ridership Scenario** | | | | | | | | | |
| 1,472,840 | 1,724,950 | -4,067,690 | -16,978,030 | -6,915,450 | -12,855,700 | -9,510,300 | -28,108,780 | 1.0 | 1.1 |

*Source: Authority 2019c, 2019d*
MMBtu = million British thermal units
VMT = vehicle miles traveled
[1] The Authority developed the two scenarios (medium ridership and high ridership) for three different years: 2015 Existing Conditions, 2029 Plus Project conditions (opening), and 2040 Plus Project conditions (Phase 1 of the HSR system horizon 2040). Both scenarios are based on the level of ridership as presented in *Connecting and Transforming California, 2016 Business Plan* (Authority 2016b). These scenarios assume different background conditions. For example, forecast trends in demographics and travel costs can influence ridership for any HSR scenario. The medium scenario was developed using the "most likely" values of all inputs to the HSR ridership forecasting model, while the high scenario used inputs that were set at values that result in ridership at the 75th percentile of the range considered in the ridership risk analysis. The 2016 Business Plan provides additional detail on the travel forecasts and risk analysis.
[2] Where applicable, values are presented for Alternative B (Viaduct to I-880) first, followed by Alternative B (Viaduct to Scott Boulevard). If only one value is presented, the value would be identical under both Alternative B viaduct options.

#### CEQA Conclusion

There would be a less-than-significant impact under CEQA because operation under both project alternatives would result in a net decrease in transportation energy consumption from other modes of transportation. The project would result in energy savings, alleviate demand on energy resources, and encourage the use of efficient transportation alternatives, and therefore the project would have a beneficial effect. Operation of the HSR would result in a reduction in VMT in San Francisco, San Mateo, and Santa Clara Counties and would result in a reduction in airplane flights in the Bay Area where the project is located. The reduction in energy consumption for other modes of transportation that would result from operation of the HSR exceeds the increase in energy consumption for operation of the project, resulting in a net decrease in statewide energy consumption. As a result, operation of the HSR would result in a net benefit to energy resources. Because the project would minimize energy consumption for operations, operation energy consumption would not place a substantial demand on regional energy supply or require substantial additional capacity or substantially increase peak- and base-period electricity demand. Through effective energy-saving design features and net reduction in energy consumption for transportation modes, there would be a beneficial impact on energy resources. Therefore, CEQA does not require any mitigation.

## 3.6.7 Mitigation Measures

No mitigation measures are required for public utilities and energy.

## 3.6.8 Impact Summary for NEPA Comparison of Alternatives

As described in Section 3.1.5.4, the effects of project actions under NEPA are compared to the No Project condition when evaluating the impact of the project on the resource. The determination of effect was based on the context and intensity of the change that would be generated by construction and operation of the project. Table 3.6-23 shows the project impacts by alternative, followed by a summary of the impacts.

**Table 3.6-23 Comparison of Project Alternative Impacts for Public Utilities and Energy**

| Impacts | Alternative A | Alternative B |
|---|---|---|
| **Public Utilities** | | |
| Impact PUE#1: Planned and Accidental Temporary Interruption of Utility Service | Planned and accidental interruptions to utility services would be temporary and for short durations. There are 259 major utility lines in the RSA for Alternative A. | Similar to Alternative A, except there are 239 major utility lines in the RSA for Alternative B (Viaduct to I-880) and 233 major utility lines in the RSA for Alternative B (Viaduct to Scott Boulevard). |
| Impact PUE#2: Existing Major Utilities Requiring Relocation or Removal | Both project alternatives would minimize permanent conflicts between major utilities because existing major utilities would be permanently relocated or protected in place through agreements between the Authority and utility service providers. Alternative A would require the following:<br>▪ Relocation of 53 major utilities<br>▪ Protection in place of 199 major utilities<br>▪ Extension of 6 major utilities<br>▪ Unknown action (relocation, protection in place, or extension) to be taken on 1 major utility | Similar to Alternative A, except Alternative B (Viaduct to I-880) would result in the following:<br>▪ Relocation of 76 major utilities<br>▪ Protection in place of 151 major utilities<br>▪ Extension of 11 major utilities<br>▪ Unknown action (relocation, protection in place, or extension) to be taken on 1 major utility<br>Alternative B (Viaduct to Scott Boulevard) would result in the following:<br>▪ Relocation of 72 major utilities<br>▪ Protection in place of 150 major utilities<br>▪ Extension of 11 major utilities |

| Impacts | Alternative A | Alternative B |
|---|---|---|
| Impact PUE#3: Reduced Access to Existing Utilities in the HSR Right-of-Way | Access to utilities would be provided during and after construction. | Same as Alternative A |
| Impact PUE#4: Temporary Impacts from Construction of New Utility Infrastructure | Alternative A includes the construction of an electrical substation at the Brisbane LMF. | Alternative B (both viaduct options) includes the construction of an electrical substation at the Brisbane LMF, a TPSS, and OCS infrastructure on viaduct structures in the San Jose Diridon Station Approach Subsection. |
| Impact PUE#5: Temporary Impacts from Water Use | Construction would require 0.24 million gallons of daily water use, which is 0.15% of the water used by local jurisdictions within the RSA in 2015. | Construction of Alternative B (Viaduct to I-880) would require 0.26 million gallons of daily water use, which is 0.16% of the water used by local jurisdictions in the RSA in 2015.<br>Construction of Alternative B (Viaduct to Scott Boulevard) would require 0.34 million gallons of daily water use, which is 0.22% of the water used by local jurisdictions in the RSA in 2015. |
| Impact PUE#6: Temporary Impacts from Wastewater and Stormwater Generation | Construction would require treatment of up to 0.24 mgd, which is less than 0.1% of the total wastewater treatment capacity in the RSA.<br>Additionally, project features would minimize generation of stormwater from project construction, such that the capacity of existing stormwater management systems would not be exceeded. | Construction of Alternative B (Viaduct to I-880) would require treatment of up to 0.26 mgd, which is less than 0.1% of the total wastewater treatment capacity in the RSA.<br>Construction of Alternative B (Viaduct to Scott Boulevard) would require treatment of up to 0.34 mgd, which is less than 0.2% of the total wastewater treatment capacity in the RSA.<br>Additionally, project features would minimize generation of stormwater from project construction, such that the capacity of existing stormwater management systems would not be exceeded. |

| Impacts | Alternative A | Alternative B |
|---|---|---|
| Impact PUE#7: Temporary Generation of Solid Waste and Hazardous Wastes | Construction would result in 2,262,800 cubic yards of surplus excavation material, 74% of which, or 1,674,472 cubic yards would be considered solid waste requiring disposal.<br>Construction would generate approximately 75,170 cubic yards of C&D debris from the demolition of existing buildings. It is currently unknown how much of the demolition debris would be considered hazardous; however, the amount of hazardous waste generation from building demolition activities is assumed to be no greater than the amount of nonhazardous solid waste (C&D debris) generation from building demolition activities for the purposes of comparison to available hazardous waste disposal capacity.<br>Based on the estimated solid and hazardous waste landfill capacity at the available landfills, there would be sufficient capacity for the solid and hazardous waste generated from the construction of Alternative A. | Construction would result in 1,623,700 million cubic yards of surplus excavation material, 100% of which would be reused and would not require disposal at a landfill. In addition, 432,000 cubic yards, generated during earthwork at the Brisbane LMF, may be contaminated and require special disposal as hazardous waste.<br>Construction would generate approximately 154,380 cubic yards of C&D debris from the demolition of existing buildings for Alternative B (Viaduct to I-880) and approximately 171,700 cubic yards of C&D debris for Alternative B (Viaduct to Scott Boulevard). It is currently unknown how much of the demolition debris would be considered hazardous; however, the amount of hazardous waste generation from building demolition activities is assumed to be no greater than the amount of nonhazardous solid waste (C&D debris) generation from building demolition activities for the purposes of comparison to available hazardous waste disposal capacity<br>Based on the estimated solid and hazardous waste landfill capacity at the available landfills, there would be sufficient capacity for the solid and hazardous waste generated from the construction of Alternative B (both viaduct options). |
| Impact PUE#8: Continuous Permanent Impacts from Water Use | Operation of the 4th and King Street Station, Millbrae Station, San Jose Diridon Station, and LMF would increase the water demand by, at most, 132,500 gallons per day. Project features would effectively recycle and reuse water where possible and reduce overall consumption. | Same as Alternative A |
| Impact PUE#9: Continuous Permanent Impacts from Wastewater Generation | Operation of the 4th and King Street Station, Millbrae Station, San Jose Diridon Station, and LMF would increase the amount of water that would be treated by up to 132,500 gallons per day. Wastewater would be disposed of properly and handled safely and would not exceed the available treatment capacity of local wastewater treatment plants. | Same as Alternative A |
| Impact PUE#10: Permanent Impacts on Storm Drainage Facilities | Operation of the project would include effective measures to manage and treat stormwater through the installation of infiltration or detention facilities and incorporation of permeable vegetated surfaces to accommodate increased rates and amount of runoff, and to increase infiltration and groundwater recharge. | Same as Alternative A |

| Impacts | Alternative A | Alternative B |
|---|---|---|
| Impact PUE#11: Continuous Permanent Generation of Solid Waste and Hazardous Waste | Operation of the 4th and King Street Station, Millbrae Station, San Jose Diridon Station, and LMF would generate an additional 3,092 cubic yards per year of solid waste. The amount of hazardous waste generated from operation of the stations and the LMF would be less than the amount of nonhazardous solid waste generated from these facilities (3,092 cubic yards per year). Solid waste and hazardous waste generation from operations would not exceed available disposal capacity. | Same as Alternative A |
| **Energy** | | |
| Impact PUE#12: Temporary Consumption of Energy during Construction | Construction would require 9,977 billion Btu. | Construction would require 10,911 billion Btu for Alternative B (Viaduct to I-880) and 10,778 billion Btu for Alternative B (Viaduct to Scott Boulevard). |
| Impact PUE#13: Continuous Permanent Impacts from Energy Consumption during Operations | Operations would result in a net decrease in regional energy consumption of 6,188,240 MMBtu per year for the medium ridership scenario and a net decrease of 6,088,470 MMBtu per year for the high ridership scenario in 2040. It would take approximately 3.3 and 2.9 years of regional energy reductions to recoup the energy consumed during construction under the medium and high ridership scenarios, respectively.<br>Operations would result in a net decrease in statewide energy consumption of 19,281,610 MMBtu per year for the medium ridership scenario and a net decrease of 28,108,780 MMBtu per year for the high ridership scenario in 2040.<br>It would take approximately 0.85 and 1.0 year of statewide energy reductions to recoup the energy consumed during construction under the medium and high ridership scenarios, respectively. | Same as Alternative A, with the exception of the payback period for construction energy.<br>It would take approximately 3.6 years of regional energy reductions to recoup the energy consumed during construction under the medium ridership scenario for Alternative B (both viaduct options). It would take approximately 3.2 and 3.1 years of regional energy consumption to recoup the energy consumed during construction under the high ridership scenarios, respectively for Alternative B (Viaduct to I-880) and Alternative B (Viaduct to Scott Boulevard).<br>The payback period for statewide energy reductions would be 0.92 year for the medium ridership scenario and 1.1 years for the high ridership scenario for Alternative B (Viaduct to I-880) and would be 0.93 year for the medium ridership scenario and 1.1 years for the high ridership scenario for Alternative B (Viaduct to Scott Boulevard). |

Btu = British thermal unit
C&D = construction and demolition
HSR = high-speed rail
I- = Interstate
LMF = light maintenance facility
mgd = million gallons per day
MMBtu = million British thermal units
OCS = overhead contact system
RSA = resource study area
TPSS = traction power substation

Construction of the project alternatives has the potential to affect existing utility facilities temporarily. Alternative A would affect more major utilities [relocation of 53 major utilities, protection in place of 199 major utilities, extension of 6 major utilities, and unknown action (either relocation, protection in place, or extension) for 1 major utility] than Alternative B (Viaduct to I-880) [relocation of 76 major utilities, protection in place of 151 major utilities, extension of 11 major utilities, and unknown action (either relocation, protection in place, or extension) for 1 major utility] and Alternative B (Viaduct to Scott Boulevard) [relocation of 72 major utilities, protection in place of 150 major utilities, and extension of 11 major utilities]. The potential for interruptions to utility services would be greater under Alternative B (Viaduct to I-880) and Alternative B (Viaduct to Scott Boulevard) due to the difference in the project alternatives' proximities to major utility lines. Planned utility interruptions during construction would be temporary, and because users would receive advance notice of interruptions, any inconvenience to residents and businesses from relocation activities would be minimal and would not result in lengthy or harmful interruptions of service. In addition to planned utility interruptions, construction activities could result in the accidental temporary interruption of unknown major linear nonfixed utilities (e.g., electricity, potable water, recycled water, wastewater, natural gas lines). Because utility identification would be completed prior to commencement of construction, accidental utility interruptions would be minimized and would be temporary and limited to short durations during construction. Therefore, the expansion of existing or construction of new infrastructure would not be required, preventing significant environmental effects. Through effective coordination in the planning and relocation of major utilities, conflicts between project construction and major utilities would be minimized and would not result in lengthy and harmful interruption of service, impacts on utility service providers or customers, or the construction or relocation of utilities which could cause significant environmental effects.

Construction of the project would not result in reduced access to existing utilities in the HSR right-of-way; permanent conflicts with existing major utilities requiring relocation or removal; or temporary impacts from construction of new utility infrastructure. Project features include coordination with utility service providers to avoid permanent conflicts with utilities during construction and coordination with service providers to allow for continued access within the right-of-way for maintenance of utility lines during operations. Relocations and reinstallation of utility lines would be conducted by the contractor and the utility service provider in accordance with design standards and regulatory requirements, including CPUC General Order 131-D for electrical systems. The alternatives would not result in lengthy and harmful interruptions of service due to reduced access or require or result in the construction of new utility facilities or expansion and upgrade of existing utility facilities that could cause significant environmental effects.

Construction of new water, wastewater, or stormwater infrastructure would adhere to permit requirements and local water management authority standards, thereby minimizing impacts from construction of new utility infrastructure. Construction of both alternatives would require the construction of new electrical infrastructure in certain locations; however, the construction of the new utility infrastructure would not cause environmental effects because all network upgrades would be implemented pursuant to CPUC General Order 131-D. The construction of both alternatives would also not result in a permanent adverse effect on utility services to utility customers.

Alternative B (Viaduct to Scott Boulevard) would require more water during construction (342 million gallons) than Alternative B (Viaduct to I-880) (290 million gallons) or Alternative A (257 million gallons). This increase would be small relative to existing demand and projected available supplies. The contractor would implement the Authority's Water Conservation Guidance and project features (including water conservation and use of nonpotable and recycled water for construction activities) to minimize use of potable water for construction-related activities. There is sufficient water supply to accommodate construction water use and reasonably foreseeable future development during normal, dry, and multiple dry years. Assuming that all water used in construction could be disposed of in the sanitary sewer, Alternative B (Viaduct to Scott Boulevard) would generate approximately 85 million more gallons of wastewater than Alternative A, and Alternative B (Viaduct to I-880) would generate approximately 52 million gallons more wastewater than Alternative A. The quantity of wastewater that would be generated during construction is currently unknown; however, it would be less than the amount of water used during construction. The assumption that the amount of wastewater generated during construction is equal to the volume of water required for construction should account for the minimal amount of wastewater that would be generated from dewatering. Construction activities would not result in impacts on local wastewater treatment because there is sufficient capacity for the existing wastewater treatment providers to serve the project's projected demand in addition to their existing commitments and the project does not require the construction of new or expansion of existing wastewater facilities. Furthermore, because the wastewater generated during construction would be treated at existing wastewater facilities that are required to comply with RWQCB regulations, the wastewater generated during construction would not exceed RWQCB wastewater treatment requirements. Additionally, project features, including BMPs, implementation of the SWPPP, and conformance with the CGP and local wastewater management jurisdiction permit requirements would minimize the generation of stormwater from project construction. Temporary stormwater management structures would be built as needed, in accordance with the SWPPP and applicable permit requirements, so the capacity of existing stormwater management systems would not be exceeded. The project would not require the construction of new stormwater drainage facilities or expansion (beyond those temporary stormwater management structures required by the SWPPP) of existing WWTPs and stormwater management facilities during construction.

Construction of the project would generate solid waste and hazardous waste from demolition of buildings and structures, excavation, and operation of construction equipment. Alternative A would generate more solid waste during construction from excavation and grading activities (1,749,642 cubic yards) than Alternative B (Viaduct to I-880), which would generate approximately 154,380 cubic yards of solid waste and Alternative B (Viaduct to Scott Boulevard), which would generate approximately 171,700 cubic yards of solid waste. Through implementation of a demolition plan, proper disposal at landfills, and the safe handling and management of hazardous materials, project features would minimize impacts from the temporary generation of solid and hazardous wastes. Existing landfills have adequate capacity for disposal of C&D debris and excavation and grading material under the project alternatives. Construction of the project would not generate solid waste in excess of state or local standards or in excess of the capacity of local infrastructure, and would not impair the attainment of state or local solid waste reduction goals. Solid waste and hazardous waste disposal procedures would comply with federal, state, and local statutes and regulations related to solid waste and hazardous waste management.

Operation of the project would not result in permanent impacts from water use. Water would be used for domestic consumption and maintenance at the stations and Brisbane LMF. Water use for operations would not result in impacts because sufficient water supplies would be available to serve operation of the project and reasonably foreseeable future development during normal, dry, and multiple dry years. Project features allow for use of recycled or reclaimed water for nonpotable uses where available that would minimize the use of water resources; therefore, the amount of water consumed for project operations could be less than that estimated for this Draft EIR/EIS analysis. Operation of the project would not result in impacts from wastewater generation because wastewater generated at stations and the LMF during operations would be discharged to the sewer system and there is adequate capacity at the existing WWTPs to serve the project's projected wastewater treatment demand, in addition to their existing commitments. The construction of new wastewater infrastructure or the expansion of existing facilities would not be required. Furthermore, the WWTPs that would serve the project are required to adhere to RWQCB treatment requirements. The wastewater generated by the project would, therefore, not exceed RWQCB wastewater treatment requirements. Operation of the project would not require or result in the need for new or expanded storm drainage facilities beyond those that would be built within the project footprint as part of the project analyzed throughout this Draft EIR/EIS. Operation of the project would include effective measures to manage and treat stormwater through the installation of infiltration or detention facilities and incorporation of permeable vegetated surfaces to accommodate increased rates and amount of runoff, and to increase infiltration and groundwater recharge.

Operation of the project would not result in permanent impacts from solid waste and hazardous waste generation. Operations would generate solid waste and hazardous waste from domestic trash at stations and maintenance facilities and waste generated from maintenance facility operation. Permanent generation of solid and hazardous waste would not result in impacts because the implementation of a hazardous materials and waste management plan would minimize waste generation, and waste generation would not exceed available disposal capacity. Operations impacts on water use, wastewater generation, and solid waste generation would be the same for Alternative A and Alternative B because water use, wastewater generation, and solid waste generation would be associated with station and maintenance facility operations that would be the same for both project alternatives. Operation of the project would not generate solid waste in excess of state or local standards or in excess of the capacity of local infrastructure, and would not impair the attainment of state or local solid waste reduction goals. Solid waste and hazardous waste disposal procedures would comply with federal, state, and local statutes and regulations related to solid waste and hazardous waste management.

During construction, energy would be consumed to transport construction materials and to support major staging areas, field offices, and security lighting. O&M of construction equipment during the construction period would also consume energy resources (fossil fuels). The energy consumption would be approximately 9,977 billion Btu for Alternative A, 10,911 billion Btu for Alternative B (Viaduct to I-880), and 10,778 billion Btu for Alternative B (Viaduct to Scott Boulevard), with payback periods for energy consumed during construction ranging from 3.2 to 3.6 years for regional reductions in energy consumption associated with project operations for Alternative B (Viaduct to I-880) for the medium and high ridership scenarios, from 3.1 to 3.6 years for Alternative B (Viaduct to Scott Boulevard) for the medium and high ridership scenarios, and from 2.9 to 3.3 years for Alternative A for the medium and high ridership scenarios. Alternative A would use less energy during construction and would have a faster payback period than Alternative B (both viaduct options). Energy consumption during project construction would not place a substantial demand on regional energy supply, require construction of substantial additional electric generating capacity, or substantially increase peak- or base-period electricity demand. Construction of the project would not result in potentially significant environmental impacts due to wasteful, inefficient, or unnecessary consumption of energy resources or conflict with or obstruct a state or local plan for renewable energy or energy efficiency.

Operation of the project alternatives would decrease automobile VMT and reduce energy consumption by automobiles, resulting in an overall reduction in energy use for intercity and commuter travel. Because of the similarity in lengths of the project alternatives, impacts from energy use during operations would be the same for the project alternatives. The net change in energy use associated with the project alternatives would be an energy savings of 6,188,240 MMBtu per year for the medium ridership scenario and a net decrease of 6,088,470 MMBtu per year for the high ridership scenario in 2040. Operation of the HSR would result in a net benefit to energy resources. Because the project would minimize energy consumption for operations, operation energy consumption would not place a substantial demand on regional energy supply or require substantial additional capacity or substantially increase peak- and base-period electricity demand. Through effective energy-saving design features and net reduction in energy consumption for transportation modes, there would be a beneficial impact on energy resources.

### 3.6.9 CEQA Significance Conclusions

As described in Section 3.1.5.4, this section evaluates the impact of project actions under CEQA against thresholds to determine whether a project action would result in no impact, a less-than-significant impact, or a significant impact. Table 3.6-24 shows the CEQA significance conclusions for each impact discussed in Section 3.6.6.

**Table 3.6-24 CEQA Significance Conclusions and Mitigation Measures for Public Utilities and Energy**

| Impacts | Impact Description and CEQA Level of Significance before Mitigation | Mitigation Measures | CEQA Level of Significance after Mitigation |
|---|---|---|---|
| **Public Utilities** | | | |
| Impact PUE#1: Planned and Accidental Temporary Interruption of Utility Service | Less than significant for the project alternatives: Through effective coordination and notification activities, project features (e.g., PUE-IAMF#3 and PUE-IAMF#4), would minimize potential effects on major utilities. The planned temporary reconstruction or relocation of major nonlinear fixed and linear nonfixed facilities or accidental utility conflicts during project construction would be conducted in accordance with the construction safety management plan and safety and security management plan for the project (SS-IAMF#2). The project would not result in lengthy or harmful interruptions of service. | No mitigation measures are required. | N/A |
| Impact PUE#2: Existing Major Utilities Requiring Relocation or Removal | Less than significant for the project alternatives: Through effective coordination to plan and implement removals and relocations of major utilities and notification of the public, conflicts with major linear nonfixed utilities from the alternatives would not result in a lengthy and harmful interruption of service, impacts on utility service providers or customers or the construction or relocation of utilities which could cause significant environmental effects. | No mitigation measures are required. | N/A |
| Impact PUE#3: Reduced Access to Existing Utilities in the HSR Right-of-Way | Less than significant for the project alternatives: Implementation of standard engineering and utility access practices for utilities remaining within the right-of-way would allow for the continued access to utilities for repair and maintenance while maintaining HSR operations. The project would not result in the construction or expansion of electrical facilities; the relocation of nonlinear fixed facilities; or the reconstruction or relocation of a major linear nonfixed facility. The project would also not result in lengthy and harmful interruptions of service due to reduced access or require or result in the construction of new utility facilities or expansion and upgrade of existing utility facilities that could cause significant environmental effects. | No mitigation measures are required. | N/A |
| Impact PUE#4: Temporary Impacts from Construction of New Utility Infrastructure | Less than significant for the project alternatives: Construction of new electric power facilities for the project would not cause significant environmental effects. | No mitigation measures are required. | N/A |

| Impacts | Impact Description and CEQA Level of Significance before Mitigation | Mitigation Measures | CEQA Level of Significance after Mitigation |
|---|---|---|---|
| Impact PUE#5: Temporary Impacts from Water Use | Less than significant for the project alternatives: Water conservation measures and use of nonpotable and recycled water for construction activities would reduce water use during construction. There is sufficient water supply available to serve project construction and reasonably foreseeable future development in normal, dry, and multiple dry years. | No mitigation measures are required. | N/A |
| Impact PUE#6: Temporary Impacts from Wastewater and Stormwater Generation | Less than significant for the project alternatives: The contractor would construct new stormwater management structures in accordance with the SWPPP and stormwater management and treatment plan. Temporary impacts on drainage patterns and stormwater runoff during construction are described in Impact HYD#1. Project features, such as implementing BMPs and a SWPPP as well as complying with local jurisdiction municipal separate storm sewer system permit requirements and RWQCB requirements, would minimize impacts from wastewater and stormwater generation. Furthermore, there is adequate capacity at the wastewater treatment plants to accommodate the wastewater that would be generated during construction, which represents 0.15% of the total wastewater treatment capacity in the public utilities RSA. | No mitigation measures are required. | N/A |
| Impact PUE#7: Temporary Generation of Solid Waste and Hazardous Waste | Less than significant for the project alternatives: Solid waste and hazardous waste generation would not exceed the capacity of existing facilities in the RSA and impacts would be avoided through safe handling and disposal procedures and through compliance with existing regulations. Solid waste landfills within the RSA have sufficient permitted capacity for disposal of solid waste that would be generated during construction of the project alternatives; solid and hazardous waste management for the project alternatives would comply with federal, state, and local requirements related to solid and hazardous waste. | No mitigation measures are required. | N/A |
| Impact PUE#8: Continuous Permanent Impacts from Water Use | Less than significant for the project alternatives: There is sufficient water supply available to serve project operation and reasonably foreseeable future development in normal, dry, and multiple dry years. | No mitigation measures are required. | N/A |

| Impacts | Impact Description and CEQA Level of Significance before Mitigation | Mitigation Measures | CEQA Level of Significance after Mitigation |
|---|---|---|---|
| Impact PUE#9: Continuous Permanent Impacts from Wastewater Generation | Less than significant for the project alternatives: Wastewater generated at the stations and LMF would be discharged to the sewer system and would not exceed available treatment capacities of local WWTPs. There is adequate capacity at the existing WWTPs to serve the project's projected wastewater treatment demand, in addition to their existing commitments. The construction of new wastewater infrastructure or the expansion of existing facilities would not be required, and the wastewater generated by the project would not exceed RWQCB wastewater treatment requirements. | No mitigation measures are required. | N/A |
| Impact PUE #10: Permanent Impacts on Storm Drainage Facilities | Less than significant for the project alternatives: Permanent impacts on drainage patterns and stormwater runoff are described in Impact HYD#2. Operation of the project would include effective measures to manage and treat stormwater through the installation of infiltration or detention facilities and incorporation of permeable vegetated surfaces to accommodate increased rates and amount of runoff, and to increase infiltration and groundwater recharge. Operation of the project would not require or result in the need for new or expanded storm drainage facilities beyond those that would be built within the project footprint as part of the project analyzed throughout this Draft EIR/EIS. | No mitigation measures are required. | N/A |
| Impact PUE#11: Continuous Permanent Generation of Solid Waste and Hazardous Waste | Less than significant for the project alternatives: Waste generation during operations would not exceed the capacity of permitted solid and hazardous waste landfills and would be disposed of in a manner consistent with applicable regulations. Solid waste landfills within the RSA have sufficient permitted capacity for disposal of solid waste that would be generated during operation of the project alternatives; solid and hazardous waste management for the project alternatives would comply with federal, state, and local requirements related to solid and hazardous waste. | No mitigation measures are required. | N/A |

| Impacts | Impact Description and CEQA Level of Significance before Mitigation | Mitigation Measures | CEQA Level of Significance after Mitigation |
|---|---|---|---|
| **Energy** | | | |
| Impact PUE#12: Temporary Consumption of Energy during Construction | Less than significant for the project alternatives: Energy consumption would not place a substantial demand on regional energy supply, require construction of substantial additional electric generating capacity, or substantially increase peak- or base-period electricity demand. The project would not result in potentially significant environmental impacts due to wasteful, inefficient, or unnecessary consumption of energy resources. The project would not conflict with or obstruct a state or local plan for renewable energy or energy efficiency. | No mitigation measures are required. | N/A |
| Impact PUE#13: Continuous Permanent Impacts from Energy Consumption during Operations | No impact for all alternatives: Operation of the project would result in a net decrease in transportation energy use. | No mitigation measures are required. | N/A |

BMP = best management practice
CEQA = California Environmental Quality Act
HSR = high-speed rail
LMF = light maintenance facility
N/A = not applicable
RCRA = Resource Conservation and Recovery Act
RWQCB = Regional Water Quality Control Board
SWPPP = stormwater pollution prevention plan